

LIST
OF
Subjects in Arts and Sciences in which
Research was carried out in
the Universities and
Research Institutions
1948-50

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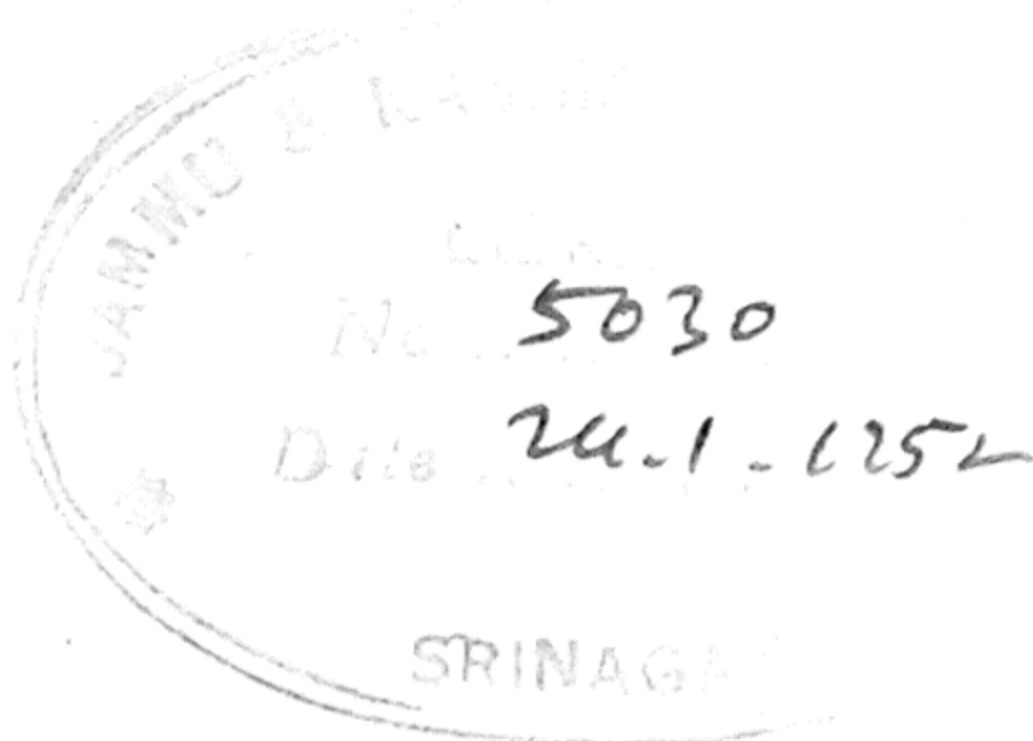
Issued By
THE INTER-UNIVERSITY BOARD
OF INDIA

DELHI
September, 1951

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RESEARCH WORK DONE IN DIFFERENT UNIVERSITIES AND INSTITUTIONS

AGRA

ARTS

C O M M E R C E

1. Indian Company Management.
2. Problems of Indian Insurance.

E C O N O M I C S

1. The Reserve Bank of India.
2. Population trends in India.
3. The War and Indian Currency.
4. Corporation Finance in India with special reference to War-time Development.
5. Industrial Development of Rajputana.
6. Economic Changes in Tube-well Areas.
7. Indian Budgets since Montford Reforms.
8. Wartime Rationing of Food Grains in U. P.
9. Economic Survey of the Alwar State.
10. Labour conditions in Match Industry in India.
11. Agricultural Labour and Wages in U. P.
12. The Condition of Labour in unregulated factories in U. P.
13. The definition and scope of Economics.
14. Industrial Labour unrest in India.
15. Economic life and its Reorganisation in Mainpuri and Etawah Districts of U. P.
16. A Survey of Economic controls in India in relation to Essential Commodities.
17. Economic Publicity in India.
18. Production and Marketing of Sugarcane in the Central Range of U. P.
19. Modern Banking in India.

20. The importance of Cottage-scale glass industry in India, how it can be developed.
21. Local finance in U. P.
22. Trade Unionism in India.
23. Economic conditions in the Greater Rajasthan Union.
24. The Changing Structure of India's Foreign Trade since 1914.
25. A study of the Economic problems of Malwa Union.
26. Lock and allied industries at Aligarh.
27. Produce exchanges in the United Provinces.
28. War Finance and its after-effects in India from 1939-40.
29. Planning of Western U.P.
30. Large scale production & Industrial Finance in U. P.
31. Wages Incentive in U. P. with special reference to Textile Industry.
32. The Industry of Perfumery in U. P. with special reference to Kanauj, Jaunpur and Sikanderpur.
33. U. P. Finance since 1935
34. Local Finance in U. P.
35. Coal Industry in India during World War 1939-45 and after.
36. Municipal Finance in U. P.
37. The scope for Plywood & Tea Chest Industry in India.

ENGLISH

1. Patriotism in Modern English Poetry from 1890 to 1940.
2. William Somerset Maugham: the study of a popular novelist of the 20th century.
3. John Middleton Murry as a critic with sidelights on Modern Criticism.
4. Art of Biography.
5. Prose writings of Tagore, Mahatma Gandhi and Jawaharlall Nehru.
6. Dramas of Eugene O'Neill.
7. Charles Morgan.

GEOGRAPHY

1. Agriculture and distribution of Principal Crops in relation to Population.

2. Types of Rural Habitation in the Upper Ganges Valley.

H I N D I

1. Mysticism in Modern Hindi Poetry with special reference to its Origin in the Upanishads and its Emergence in the Medieval Periods.
2. Keshava Das.
3. History of Hindi Journalism.
4. Bhartendu Babu Harish Chandra.
5. English Influence on Modern Hindi Drama and Poetry.
6. Development of the Hindi Novel, 1867-1942.
7. A critical study of the versatile genius of Jai Shankar Prasad.
8. Development of Criticism in Modern Hindi Literature, 1868-1943.
9. Critical and formal Survey of Hindi Poetry.
10. The last 25 years of Modern Hindi Poetry.
11. A critical study of the evolution of the Essay in Hindi Literature.
12. Gupta Bandhu and his Works.
13. The Evolution and the form of Nationalism in Modern Hindi Literature.
14. Criticism, its origin and evolution in Hindi Literature.
15. Alankaras in Hindi Literature.
16. The mind and art of Ratnakar.
17. Thoughts of Kabir.
18. A study of the erotic sentiment in Hindi Poetry from 1600-1850.
19. Tulsi ki Kavyakala.
20. Epics of the 20th Century.
21. Pastoralism in Hindi Poetry.
22. Hindiki Samajik Kahaniyonka Vivechnatmak addhyayan.
23. Literary & Biographical studies in Varta Literature from 1550-1750 A.D.
24. Love and Beauty in Modern Hindi Poetry.
25. Study of Vatsaliya Ras in Bhagti Yug.
26. Evolutionary and critical studies in Modern Braj Poetry, 1850-1950.

27. Upanyaskar Premchand, Unki Kala, Samajik Vichar aur Jivan Darshan.
28. Rasai in Kavya.
29. Romanticism in Modern Hindi Poetry.
30. Srimad Bhagwat and Surdass.
31. Vidyapati—A study of his life and works.
32. Mahakavi Som Nath—his mind and art.

HISTORY

1. History of Malwa.
2. History of Bundelkhand, 1772-1856.
3. History of the ceded and conquered (later N.W.) Provinces from 1803-1853.
4. Influence of Contemporary British Politics in Indian Constitutional History.
5. Social life as depicted in Sutras.
6. The relation of Mewar and the Marathas.
7. The Religious leanings of the Sultans of Delhi.
8. Judicial Administration of the Territories of the East India Company from 1765 to 1858.
9. Toynbee's Philosophy of History.
10. Armies of the East India Company.
11. Famine and Famine Policy of Govt. of India, 1858-1918.
12. All-India Muslim League, its History, Activities and Achievements.
13. Liberal Party as a Factor in Indian Politics and Statesmanship in the contemporary Social and Political History of India.

PERSIAN

1. Persian Language and Literature in India during the reign of Aurangzeb.

PHILOSOPHY

1. Psychoanalysis and its ethical implications.
2. The Philosophy of Tulsidas
3. Caste Stereotypes among Hindus.

P O L I T I C S

1. Political Aspects of Gandhism.
2. Political Parties in India.
3. The political and civic status of Indians in Ceylon.
4. Nationalities in U.S.S.R.
5. Political & Civic status of Indians in South Africa.

S A N S K R I T

1. The Origin and development of the Alankaras in Sanskrit Literature.
2. A Psychological study of the Rasa Theory in Indian Poetics.
3. The Philosophical conception of Word (Shabda) in Sanskrit Literature.
4. Family relationships in Rgvedic Age.
5. Asvaghosha & Kalidasa.
6. Dhawani School in Sanskrit Poetics.

U R D U

1. Metaphysics of Iqbal.
2. Urdu Poetry in the Rajputana States.
3. Life and Work of Prem Chand and his effect on Urdu Literature.
4. Influence of English on Urdu Literature.
5. Hakim Moin Khan.

S C I E N C E

A G R I C U L T U R E

1. An investigation of the effects of the continuous cropping of wheat without the application of manure on the nutrient status of alluvial soil of Kanpur.
2. Studies on the mango leaf Hopper I diocerus app. (Hemiptera Iassidal) II Studies on the insecticidal properties of some indigenous plant material.
3. Agricultural labour condition in U. P.
4. Chlorophyle Development in Wheat Plant and its relation to Manurial treatments.

5. Mechanization of Agriculture in U.P.
6. Rootrot of cereals and with disease of Guar.
7. Crop Physiology experimental studies in the influence of the environmental factors on the net assimilation rate of *Triticum Vulgare* and *vicia fabra*.
8. Costs and returns in farming, 1930-1948, (with reference to State farming in U.P.)
9. Investigation en the application of Hormones in the improvement of Indian Horticulture.

B O T A N Y

1. Cytology and Genetics of Inter-generic and inter-specific wheat hybrids.
2. Green ear disease of Jowar and Bajra.
3. Diseases of Cucurbits, the Morphology and Pathogenicity of the Fungi associated with the above and their control measures.
4. The biology and control of some of the serious pests of stored cereals and pulses in India.
5. I - Studies in the wilt of gram caused by a species of *Fusarium*;
II - Root-rot of spinach caused by species of *Rhizoctonia* and *Fusarium*.
6. Drought Resistance (Wheat & Barley).
7. Anatomical studies in the mechanism of Vernalisation etc.

C H E M I S T R Y

1. Studies in Photo Chemical reactions with special reference to Photo Chemical after effect.
2. Isomerisation of Thiocyanates.
3. A Study of the Alky derivatives of guanidine.
4. Further studies on the condensation of the Aldehydes with malonic acid.
5. Studies on the Biochemistry of the Lipids.
6. Studies in Parachor.
7. Condensation of Aldehydes Fheorene and Fheorene derivatives particularly in the presence of organic bases.
8. The Condensation of Aldehydes.
9. The Chemical examination of the fruits of *Luffa Echaninate* etc.

10. Synthesis of Cyclic Polyketons with Carbonyl Chloride and a study of their stability.
11. Analogy between the induction effects of light and chemical inductors.
12. Synthesis of cyclic monoketones with hydroxy Methelyne by the ketones.
13. Role of trace elements in animal nutrition with special reference to iron.
14. Reactivity of Nuclear chlorine in some Benzene derivatives.
15. Electric and Magnetic susceptibilities of liquids and solids.
16. Phytic acid Phosphorus Metabolism in Ruminants.
17. Conndensation of aldehydes etc.
18. Electrode Process.
19. Physical & Chemical Investigations of some Indian essential oils.
20. Standardization of Inorganic indigenous substances used in Ayurvedic systems of Medicine by Chemical Methods.
21. Synthesis with Carbonyl system.
22. Chemical study of Diazoketones.
23. Chemical study of the components of essential oil from Indian plants.

M A T H E M A T I C S

1. A contribution to the theory of Laplace-Stieltjes Integral.
2. Problem in Hydro-Dynamics.

P H Y S I C S

1. Spectroscopy.
2. Crystal Physics.

Z O O L O G Y

1. Variations in Arterial System of the common Indian frog and their significance.
2. Cytological studies on the Oogenesis of certain reptiles.
3. Studies in the anatomy of the Indian Scorpion.
4. The Biology of the Coccinellidæ of the U.P.
5. Morphology and Anatomy of the Common Blister Beetle.
6. Fossil Anthropods from India.
7. Animal Genetics.

8. Comparative studies on the brain of some insects.
9. Studies on the Anatomy and Physiology of Vertebrate Heart.
10. Studies on some Indian Curculionidea.
11. Studies on Indian Nematocerous Diptera.
12. Morphology of *Scolopendra morsitans*.
13. Studies in Parasitic Hymenoptera.
14. Studies on Minute Anatomy of the vocal apparatus of Indian Birds.
15. Studies in the Anatomy and development of the post sacral region in Indian Birds.
16. Studies in the structure and closure of the nerves in Vertebrates.
17. Studies on the Anatomy and development of the Vertebral column in fishes.
18. Cytological studies in the Oogenesis of *Mylabris pastulata* and *Hydrophilus*.
19. Hymenopterous Parasites of Fruit-flies from the Oriental regions.

FOR D. LITT

ECONOMICS

1. Farm Organization in India.
2. Economic Vicissitudes, Commercial Interludes and Business oscillations.

HINDI

Bharatiya Sadhna aur Sur Sahitya.

PHILOSOPHY

Some Tendencies in Modern Ethical thought of India.

SANSKRIT

The Nyaya-Vaseshika Realm & its conflict with the Buddhist Epistemology.

FOR D. SC.

Z O O L O G Y

1. Contribution to our knowledge of the early development and Placentation in *Rhinophoma kinneari* & *Rattus*.
 2. Advanced studies in Physiology, Morphology, & Embryology of *Bagrada picta*.
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ANDHRA

1948-49

P H Y S I C S

1. Spectra and Atomic Nuclei.
2. Ultrasonics.

C H E M I S T R Y

1. Analytical Chemistry of Thorium and Uranium.
2. Organic and Plant Chemistry.

G E O L O G Y

1. Study of the beach sands from Rishikonda to Bhimilipatam, Vizagapatam District.
2. Geology of the Karmapudi area, Guntur District, with special reference to the stratigraphy of Palnads.
3. Geology of the Durgi area, Guntur District, with special reference to the Stratigraphy of Palnads.
4. Geology of Parts of Raipur Area, Nellore District, with special reference to the mica-bearing Pegmatites.
5. Gondwanas of Ongole area.
6. Lead bearing veins in Parts of Cuddapah District.
7. The Stratigraphic Position of Intratrappeans of Pangud in relation to Tripetty of Upper Jurastic Age.
8. Study of Black Sand Concentrates and Geology of coastal strip from Anakapalli to Vizagapatam.
9. Geology of Wajrakarur and environs with special reference to Dyke activity.

10. Geology of Mecherala area with special reference to the stratigraphy of Palnads.

E C O N O M I C S

1. Wartime Economic problems in India.

Z O O L O G Y

1. Morphology and Bionomics of the Common Oncypode Crab of the Vizag coast.
2. Germ cells, genital ducts, size and maturity of some fishes.

C O M M E R C E

1. Social Insurance with special reference to India.
2. Banking.

M A T H E M A T I C A L P H Y S I C S

1. Physics of Crystals.
2. Crystal Dynamics.

C H E M I C A L T E C H N O L O G Y

1. High Pressure Technique.

P H Y S I O L O G Y

1. Studies in Vitamin C Nutrition of the body.

1949-50

P H Y S I C S

1. Spectra and Radio-frequencies.

C H E M I S T R Y

1. Organic Reagents in the Chemical Analysis of (a) Copper and Cadmium (b) Aluminium and Beryllium (c) Boron (d) Zirconium.
2. Analytical Chemistry of Thorium and Zirconium.
3. Physical methods of Analytical Chemistry, thorium and rare earths.
4. Catalysis and induced reactions.
5. Photo-Chemistry.
6. Chemical investigation of some plant products.

G E O L O G Y

1. Geology of Lead and Copper deposits of some parts of Guntur District.
2. The Charnockites and associated rocks between Pallavaram and Tambaram.
3. The Geology of Chipurupalle area with special reference to Manganese ores.
4. The Geology of Narasapatam area.
5. Thermal and Regional metamorphism of Sedimentary rocks with special reference to Pakhals in the Hyderabad State.

E C O N O M I C S

1. The Ricardian Theory of Economic Development.

Z O O L O G Y

1. Studies on the Development of *Scoliodon* Sp.
2. Ecological Study of the Brachyura of Waltair Coast.

T E C H N O L O G Y

1. Problem of heat and mass transfer.

A G R I C U L T U R E

1. Physiological Studies in VADLAPUDI orange (*Citrus Madraspatona* Tanaka).
2. Standardisation of some commercial plant hormones under South Indian conditions.

G E O P H Y S I C S

1. The Oscillographic methods of studying the magnetic properties of rocks.
-

ANNAMALAI**ARTS****ECONOMICS**

1. The Income-Tax Investigation Commission.
2. Rehabilitation of Provincial Finance.
3. The division of Indian Income-Tax.
4. Total Prohibition in Madras Presidency.
5. Co-operation and Cottage Industries.
6. Economic implications of Linguistic Provinces.
7. Mat weaving and carpet weaving in Madras Presidency.
8. Agricultural Income-Tax.
9. Scope and Method of teaching of Agricultural Economics.
10. India's Population - Fact and Policy.
11. Hungry People and Empty Lands.
12. Census and Statistics in India.
13. Planned Families for India.
14. Indian Emigration to America.
15. Population Problems and International Tensions.
16. World's Hunger.
17. Unesco & Population Problems.
18. An Indian Demographer Looks at the World.
19. Food & Population.
20. South African Indians.
21. Population Problems of India & Pakistan.
22. A Demographic Cycle.
23. Indo-Pakistan Population Problems.
24. Les Transferts de Populations entre Hindustan et le
•Pakistan.
25. Population & Peace in Asia.
26. Cultural Assimilation.
27. India's National Income.
28. Co-operation and Cottage Industries.
29. Our Agricultural Problems.
30. Prospects of Fresh Taxation in Madras.
31. Indian Federal Finance.
32. Maternal Mortality in India.

33. A Community Study of Criminal Tribes Resettled in South Arcot.

ENGLISH

1. A Pronouncing Dictionary of Personal Names and Place Names in Shakespeare.
2. Biblical names in Old English.
3. Narration in Shakespearean Drama.
4. Letters in Shakespeare's Plays.

HISTORY

1. Buddhism in Kerala.
2. Medieval Kerala.
3. Later Pandyas.
4. Origin of the Pallavas.
5. Temples and Temple-States of Kerala.
6. Women in Tamil Literature and History.
7. The Tamil Country under Vijayanagar.
8. Sangam Polity.
9. Buddhism in the Tamil Country.
10. Dynastic drift in South Indian History.

MATHEMATICS

1. General Theory of Infinite Series.
2. Theory of Functions of Real Variables including the Theory of Integration.
3. Theory of Analytic Functions of a Complex Variable.
4. Point-set Topology and Function Spaces.
5. Higher Geometry pure and analytical.

PHILOSOPHY

1. Schools of Saivism.
2. The Religious Experience of the "Saiva Saints".
3. Visishtadvaita Vedanta.
4. Atma Siddhi of Yamunacharya.
5. Isvara Siddhi.
6. Samvit Siddhi.

S A N S K R I T

1. Ethies of the Puranas.
2. Vedic Conception of 'Asura'.
3. Vivarana Commentary on Vyutpathi vada.
4. Grammatical bias of the modern Naiyayikas.
5. Viddivimarsa.

T A M I L

1. Elakkanathin Varalaru.
2. Thai Mozhi Vazhiyakakalvi.
3. Nattinai.
4. Kannaki.
5. pari Makzhir.
6. Pokin Pozhil.
7. Appar.
8. Kumara Kupar.
9. Ravanar.
10. Bharathiyar.
11. Raman.
12. Ner Ezhupathu.
13. Oozhavu Ezhupathu.
14. Kallatanar.
15. Kunkuzhalathanar.
16. Life of Kapilar and Paranor & History of Literature bearing on Pandirrupattu and Paripadal.
17. Vaishnavaism and Tamil Edition of the brochures 'Thittan' and Perumpanarrupabai by the late Mahavidwan R. Raghava Ayyangar.
18. History of Tamil Literature relating to the dark period.
19. Saiva poets of the 7th & 8th Centuries A.D.
20. Collected materials from Tolkappiyam wrote on Tolkappiya
21. Translated Chapters 135-150 of Kautilya's Arthasastra.

SCIENCE

B O T A N Y

1. Physiology of Sugar cane in relation to waterlogging.

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|-----|--|-----|---|
| 2. | Physiology of Sugarcane | ... | Maturity of sugarcane under water logged conditions in North Bengal. |
| 3. | Bacteriology | ... | On the occurrence of Bacteria in stems and leaves of plants I. |
| 4. | do. | ... | do. II. |
| 5. | Pollen Morphology | ... | Seasonal and Regional variations in Pollen grains I. |
| 6. | do. | ... | do. II. |
| 7. | do. | ... | Angiospermic remains of Baimer sandstones. |
| 8. | Plant Physiology | ... | On the response of leaves of Abrus to heat and light. |
| 9. | Morphology | ... | Glandular Hairs of certain flowering plants in relation to insects. |
| 10. | do. | ... | Studies in the Ecology of the Protects of apical buds in plants I. |
| 11. | do. | ... | Studies in the leaves of vascular plants (Bignoniaceae) (Epidermis). |
| 12. | Physiology | ... | Occurence of Radio-activity in plants. |
| 13. | do. | ... | Application of spectroscopy in plant breeding and determination of sex in plants. |
| 14. | Cytomorphology | ... | Sex Chromosomes in Trichosanthes palmata Roxb. |
| 15. | Morphology | ... | Differential epidermal characters in the diœcious Trichosanthes palmata Rox b. |
| 16. | Studies in the identification of a new species of Abrus. | | Studies in the morphology of a new species of Abrus. |
| 17. | Cytomorphology of Aristolochiaceæ. | | Cytomorphological studies in the Indian Aristolochiaceae. |
| 18. | Morphology | ... | Note on the occurence of mycorhiza in Aristolochia Bracheata. Retz. |

- | | | |
|-----|---|---|
| 19. | Cytomorphology of Combretaceae. | Cytomorphological studies in Combretaceae I. |
| 20. | Ecology of Mangroves. | Study of the mangrove vegetation I. Leaf. |
| 21. | Morphology ... | Note on the growth phenomenon of <i>Portulaca tuberosa</i> Roxb, |
| 22. | Cytogenetics of Phaseolus. | Cytogenetical studies in Phaseolus. |
| 23. | Hydrophytes ... | Studies in the hydrophytic vegetation of South India I. |
| 24. | | do. II. |
| 25. | | Note on the occurrence of turions of <i>Hydrilla verticillata</i> . |
| 26. | Morpho-biological Studies of Angiosperms: | Taxonomical and Morphological Studies in plants I. |
| 27. | Cytomorphology of Angiosperms. | Cytomorphological studies in <i>Celsia coromandelina</i> .
Cytomorphological studies in <i>Peltophorum ferrugineum</i> .
Cytomorphological studies in <i>Prosopis</i> sp. |
| 28. | Cytogenetics of Angiosperms. | Cytogenetical studies in <i>Clitoria ternatea</i> (white and blue). |
| 29. | Cytological technique : | Use of K C N as fixative for root tips. |
| 30. | Cytomorphology of Angiosperms. | Cytomorphological studies in <i>Baringtonia acutangula</i> . |

C H E M I S T R Y

1. Mercuration of Fluorine derivatives and cyclisation of some organic compounds.
2. Piperidine derivatives of possible therapeutic value.
3. Studies on some synthetic Phytohormones.
4. Studies on the Hydrolysis of Hard woods of South India.
5. Chemicals from Cane Sugar.
6. Metal Complexes of the hydroxy acetophenones.
7. Extraction of active principles from *Acacia* sp.

ZOOLOGY

1. Anatomy and Development of Lamellidens.
 2. A Remarkable Abnormality in the Development of *Viviparus dissimilis*.
 3. Embryology (Organogenesis) of *Aplocheilus melastigma*.
 4. Comparative Embryology of Melaniidæ.
 5. Brood-pouch epithelium (Cytology, Histology and Development) in the Oviparous Melaniidæ.
 6. On *Urnatella indica* Seshaiya - A Freshwater Entoprocten of S. India.
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BOMBAY

UNIVERSITY SCHOOL OF ECONOMICS AND SOCIOLOGY

RESEARCH WORK COMPLETED

1. Baj-Khedawal Brahmina of Gujarat.
2. Thakurs ; and Ethnic Study.
3. Industrial Labour in Bombay—A Socio-Economic Analysis.
4. Corporation Finance and Management in India.
5. Social Life and Manners of the Parsis in Iran and in India.
6. Social Differentiation & Differentiation in Emoluments.
7. Farm Ownership and Tenancy—with particular reference to the effects of Tenancy in Thana District.
8. Prostitution in the City of Bombay.
9. Agris—A Socio-Economic Survey.
10. Pricing in a Planned Economy.
11. Regional Distribution of Industries.
12. Food Crops of Gujarat.
13. Some Aspects of Economic Progress of Cochin.
14. Social Insurance for Industrial workers.
15. Social Study of the Cinema in Bombay.
16. Conciliation and Arbitration of Industrial Disputes in India.
17. Beggar Problem in Bombay City.
18. Indian Music and its Social Bearings.
19. Profits and Wages in the Cotton Industry of Bombay Province.

20. Farms and Holdings in Bombay Karnatak.
21. A Study of Rural Society.
22. Renascent India.

THESES UNDER PREPARATION

1. Economics of Minimum Wage, with special reference to India.
2. The State and the Individual.
3. The Extent of Rational Thought in Educated India.
4. Social Legislation.
5. Agrarian Tenancy in Gujarat.
6. Municipal Finance in a few leading Indian States.
7. Land Mortgage Banking.
8. Pricing in Public Utilities.
9. Socialist movement in India.
10. Social Services in India, with special reference to the City of Bombay.
11. Social Legislation in India.
12. The Indian Capital Market.
13. Impact of British Rule on the position of Indian Women.
14. The Finance of Bombay Government, 1935-36 to 1950-51.
15. Interrelations of Governments in India in the 19th Century.
16. Rural Labour in the Konkan.
17. Fundamental Rights.
18. Industries in East Punjab and States.
19. Capital formation in a backward Economy.
20. Ideological Conflicts in Indian Political Life.
21. Economic Aspects of Impact of Urbanisation on Rural Economy.
22. The Problem of minorities.
23. A Critical review of the theory of employment.
24. Socio-economic Survey of the Lower Strata of Employees in Bombay.
25. The Sonkolis.
26. Land Problems of Orissa.
27. Monetary Policy and the development of under-developed areas with special reference to India.
28. Some Aspects of Crime in India.

29. Public Finance.
30. Economic cooperation within the ECAFE region.
31. The End of the State in Ancient Hindu Political Thought.
32. Local-Self government in India.
33. State and Society in the Principal Smrtis.
34. The Liberal movement in India.
35. Agricultural Labour in Bombay Karnatak.
36. The Indian Cotton Textile Industry—an economic analysis.
37. Social & Political Philosophy of Mahatma Gandhi.
38. Agricultural Marketing in Bombay.
39. World in Evolution—a study in City development.
40. Some aspects of Economic Conditions of the Mahar Community.
41. Administrative Problems in Nationalisation.
42. Cooperative Movement in Bombay.
43. Nature of the Ancient Indian State.
44. Economic Case for Socialism in India.
45. Public Enterprise in India.
46. Exchange Banks of India.
47. State Control of Industries in India.
48. Large-scale Industries of Maharashtra.
49. Industrial Development of Travancore-Cochin State.
50. The Art and Science of Classical Dancing and its Social Bearing.
51. International Trade in Agricultural Raw Materials.
52. Some Volunteer Organizations.
53. Qualitative Economics with particular reference to India.
54. Changing Pattern of Culture (Malayalam Region).
55. Hindu Marriage.
56. Cottage Industries in India and their role in Industrial Economy.
57. Village Self-government in Bombay State.
58. Jain Community—A Social Survey.
59. Rural class structure in India—with special reference to Gujarat.
60. Social Philosophy of Gandhiji.
61. Effects of war on the Agrarian Economy in Gujarat.
62. Role of the State in India.

63. The Social and Economic objectives of Public Expenditure in India, 1937-47.
64. Some Aspects of Welfare Economics.
65. Trends in Modern Federalism.
66. Concentration of Economic Control with special reference to India.
67. Industrial Relations in Bombay.

CHEMICAL TECHNOLOGY

WORK PUBLISHED : 1ST JULY 1948 TO 30TH JUNE 1949.

1. Sulphur dyes and sulphurised vat dyes. Part I. Constitution of Hydron Blue R (*Proc. Ind. Acad. Sci.*, 1948, 28, III).
2. Raney nickel reductions, Part I (*ibid.*, 142).
3. Anthraquinone Series, Part II. Halogenated aminoanthraquinones and indanthrones (*ibid.*, 236).
4. A new synthesis of 4-hydroxycoumarins (*ibid.*, 151).
5. 6 : 7-Benzocoumaranone (*ibid.*, 160).
6. Azoic dyes, Part IX. The behaviour of w-benzoyl-2-acetyl-1-naphthol towards diazonium salts (*ibid.*, 545).
7. The constitution of citrinin (*Am. Chem. Soc.*, 1948, 70, 2287).
8. Citrinin, Part I (*Proc. Ind. Acad. Sci.*, 1949, 29, 289).
9. 3 : 3'—Dyhydroxyazobenzene— 4 : 4'—dicarboxylic acid and 4-aminosalicylic acid (*ibid.*, 196).
10. Synthetical experiments in the chromone group, Part XXIII. A new synthesis of Rhamnazin and a synthesis of 3 : 4'—dyhydroxy-7-methoxyflavone (*ibid.*, 203).
11. Fries reaction, Part II. The arrangements of the esters of dihydric phenols (*ibid.*, 269).
12. A process for the manufacture of ethyl acetate homologues (*Indian Patent No.* 37234).
13. Accelerated oxidation of cotton cellulose in presence of reducing substances, Part I (*Proc. Ind. Acad. Sci.*, 1949, 29, 277).
14. Some properties of acidic oxycellulose (*J. Sc. Ind. Res. (India)* 1949, 8B, 103).
15. Hypochlorite oxidation of cellulose in presence of mixtures of certain vat dyes, Part I (*ibid.*, 8).

16. A new method for the simultaneous dyeing of mineral khaki and vat dyes (Indian Patent No. 40755).
17. Dehydration of castor oil (*J. Sc. Ind. Res. (India)*, 1941, 7B, 184).
18. Suppository bases, Part I (*Ind. J. Pharm.*, 1948, 10, 73).
19. Anthelmintics. Isolation of calycopterin from *Calycopteris floribunda* (*ibid.*, 98).
20. Anthelmintic activity of *kamala* constituents (*ibid.*, 37).
21. Suppository bases, Part II (*ibid.*, 1949, 11, 67).
22. Antibiotics (*ibid.*, 101).
23. Vacuum operated automatic burette (Indian Patent No. 37235).
24. Determination of carotene in plant materials : a simplified procedure (*Anal. Chem.*, 1948, 20, 720).
25. Determination of amylase and amylopectin fractions of starch (*J. Biol. Chem.*, 1948, 176, 1253).
26. Influence of pH on the diastatic activity of fungal and malt amylases (*J. Am. Pharm. As.* 1948, 37, 2).
27. A process relating to the preparation of a modified tamarind seed polyose suit able for use in food industries (Indian Patent Application No. 40835).
28. A process for the hydrolysis of proteins (Indian Patent Application No. 40928).

PAPERS FORWARDED FOR PUBLICATION

1. Sulphur dyes and sulphurised vat dyes, Part II. Constitution of Cibanone Yellow R.
2. Fries reaction, Part III. The arrangement of the esters of trihydric phenols.
3. Studies in the Napthalene series, Part XVI. The preparation and properties of 2- & -4 butyl-1-naphthols.
4. Studies in the Napthalene series, Part XVII. The preparation and properties of 2- & -4-pentyl-1-naphthols.
5. Vat dyes from 2-amino and 2 : 7-diaminoanthroquinones.
6. Beta-Naphthylamine. Its production on a semi-commercial scale.
7. Some experiments in kier boiling.

8. Oxidation of cellulose in presence of mixtures of certain vat dyes, Part II.
9. Preparation of pulp from banana stalk, Part I. Preparation and analytical.
10. Preparation of pulp from banana stalk, Part II. Pulping by standard pulping agents.
11. Preparation of pulp from banana stalk, Part IV. Pulping with nitric acid.
12. Preparation of pulp from banana stalk, Part IV. Commercial utilisation.
13. Miscibility of castor oil with some petroleum products.
14. Extracts of quinine from cinchona bark, Part II.
15. Suppository bases, Part III.

WORK PUBLISHED : 1ST JULY 1949 TO 30TH JUNE 1950

1. A new reaction for the synthesis of chromones and isoflavones. (*Curr. Sci.*, 1949, 18, 373).
2. Sulphur dyes and sulphurized vat dyes. Part II. Constitution of Cibanone Yellow R—Part I. (*Proc. Ind. Acad. Sci.*, 1949, 30, 1).
3. A synthesis of Prunetin. (*Curr. Sci.*, 1949, 18, 404).
4. Dipole moments of resonance structures and the ultraviolet absorption maxima of anthracene. (*ibid.*, 1950, 19, 9).
5. A new partial synthesis of citrinin. (*ibid.*, 20).
6. Chromatographic separation of dyes. (*ibid.*, 149).
7. 8-Naphthylamine. Its production on a semi-technical scale. (*Trans. Indian Inst. of Chem. Engineers*, 1947-48, 1, 22).
8. Some experiments in kier-boiling, (*J. Sci. Ind. Res.*, 1949, 8B, 142.)
9. Hypochlorite oxidation of cellulose in presence of mixtures of certain vat dyes. Part II. (*ibid.*, 154.)
10. Studies in oxycellulose. Part I. Some properties of accelerated oxidation of oxycelluloses. (*Proc. Ind. Acad. Sci.*, 1949, 31, 234.)
11. Studies in oxycellulose. Part II. Estimation of COOH groups in cellulosic materials. (*ibid.*, 371.)

12. Miscibility of castor oil with some petroleum products. (*J. Sci. Ind. Rese*, 1949, 8B, 208.)
13. Preparation of pulp from banana stalk. (*J. Indian Chem. Soc.*, *Ind. News Edn.*, 1949, 12, 113.)
14. Antibiotics. (*Indian J. Pharmacy*, 1949, 11, 84.)
15. Anthelmintics, Part V. (*ibid.*, 1950, 12, 10.)
16. Antiseptics, Part I. (*ibid.*, 42.)
17. Tuberculocidal drugs. (*ibid.*, 66.)
18. Plantago mucilage. (*ibid.*, 68.)
19. *Ocimum basilicum*, Part I. (*ibid.*, 132.)
20. *Ocimum basilicum*, Part II. (*ibid.*, 134.)
21. Oxidation of lac by lead tetracetate. (*Curr. Sci.*, 1949, 18, 331.)
22. Iodometric determination of acid value of lac. (*Analytical Chemistry*, 1950, 22, 724.)
23. Protection of amylases against thermal inactivation, Part I. Amylase of *Aspergillus oryzae*. (*Trans. Amer. Assoc. Cereal Chem.*, 1950, 8, 46.)
24. Protection of amylases against thermal inactivation, Part I. Amylase of *Bacillus subtilis*. (*ibid.*, 49.)
25. Hydrolysis of proteins under pressure. (*Arch. Biochem.*, 1950, 26, 97.)
26. Oxidation of ascorbic acid by plant extracts. (*Nature*, 1950, 165, 318.)
27. Biosynthesis of vitamin C in germinating legumes. (*ibid.*, 765.)
28. Studies on shark liver oil, Part I. Concentration of vitamin A by cyclic distillation and chemical composition of the oil and its fractions. (*J. Sci. Ind. Res.*, 1950, 9B, 31.)
29. Studies on shark liver oil, Part II. Stability of vitamin A. (*ibid.*, 99.)
30. Studies in shark liver oil, Part III. Deodorization. (*ibid.*, 130.)

PAPERS FORWARDED FOR PUBLICATION :

1. Anthraquinone and anthrone series. Part III. Constitution of dinitrodibenzanthrone and some derivatives of 3 : 3'-dibenzanthronyl.

2. Anthraquinone and anthrone series. Part IV. Constitution of a Benzanthronequinoline and of Cyananthrone.
3. Anthraquinone and anthrone series. Part V. Chlorination of 6-aminoanthraquinoneacridones.
4. Raney nickel reductions. Part II. Thioindigo, 6:6'-Diethoxythioindigo and Thioindoxyl.
5. Azoic dyes. Part X. Brominated naphthols.
6. Antitubercular compounds. Part II. 3:5-Dilodo-4-amino-salicylic acid, 4-amino-Q-acetylsalicylic acid and other derivatives of 4-aminosalicylic acid.
7. Studies in settling. Part I. The separation of magnesium hydroxide in the manufacture of calcium chloride from magnesium chloride.
8. Studies in oxycellulose. Part III. Oxidation of cellulose in presence of a mixture of nitrogen peroxide and oxygen.
9. Studies in oxycellulose. Part IV. Chemical behaviour of accelerated oxidation oxycelluloses.
10. Accelerated oxidation of cotton cellulose in presence of reducing substances. Part II.
11. Ephedra. Part I. Estimation of total alkaloids by solvent extraction.
12. Ephedra. Part II. Estimation of total alkaloids by chromatography.
13. Catalytic effects of titanous and stannous chloride on the acid hydrolysis of casein.
14. Biosynthesis of vitamin C during germination. Parts I and II.
15. Polygalacturonase of *Aspergilli*.
16. Presumptive processing and losses in nutritional values.
17. Presumptive processing and losses in nutritional values.
18. The Chemistry of rice.
19. Studies in protein metabolism. Further observations on the influence of dietary protein or excretion of nitrogen in urine.
20. Nickel by powder metallurgy.
21. Application of dilatometry to powder metallurgy.

S T A T I S T I C S

P A P E R S P U B L I S H E D

1. On the ratio of the mean deviation to the standard deviation. Calcutta Statistical Association Bulletin. September, 1948.
2. On the moments of non-central chi-square. (*Bulletin Calcutta Statistical Association*. Vol. 41 December, 1949).
3. A note on balanced incomplete block design. (*Bulletin Calcutta Mathematical Society*. Vol. 42 March, 1950).
4. A Statistical study of the velocity of circulation of money in India. (*Bombay University Journal*, 1949).
5. On a limit theorem in the theory of probability. (*Proc. Indian Science Congress*, 1950).
6. Multivariate statistical distributions and Economic Macrodynamics. (*Current Science*, 1950).

A W A I T I N G P U B L I C A T I O N

1. On the generalised second limit theorem in the calculus of probabilities. (*Biometrika* Vol. 37 1950).
2. On a result of Birnbaum regarding Skewness of X in a bivariate normal population. (*Indian Journal of Agricultural Statistics*).
3. A note on the cumulants of a Binomial Distribution (*Mathematics Student*).

THE INSTITUTE OF SCIENCE BOMBAY I.

RESEARCH WORK PUBLISHED (1948-49)

M A T H E M A T I C S

Four Fours.

P H Y S I C S

1. Role of intensity, frequency and amount of irradiation in Joshi-effect.
2. Studies on the excitation of a Band system from a metal and its oxide.
3. Some spectral characteristics of the positive column of a sodium vapour lamp.

4. A note on the initial level of the high pressure bands of carbon.
5. Dissociation Energy of C_2 .
6. Characteristics of the First positive bands of nitrogen in a high temp. source.
7. Atomic function of some gases in the light of viscosity determination.
8. Super conductivity and Debye characteristic temperature.
9. Joshi Effect.
10. Elastic Properties of metals at supersonic speeds.

CHEMISTRY

1. Law of Additivity of Magnetic susceptibilities in Hydrates.
2. A new method for the conversion of aromatic carboxylic acids into the corresponding aldehydes.
3. Synthesis of 4-hydroxy 2-phenyl 3-acetyl quinolines.
4. Addition products of Anils with metallic chloride.
5. Chalkones-Condensation of 2 : 4 Dimethoxyacetophenone, 2 : 4-dimethoxy-5-bromacetophenone, 2-hydroxy-4-benzyloxy-5-bromo acetophenone with 2-methoxy-benzaldehyde and 2-methoxy-4-bromobenzaldehyde. Bromination of the reactivity of the bromoderivatives.
6. Nitration of Methyl 7-methoxy-4-methyl coumarin in-6-carboxylate.
7. Nitration of some coumarin derivatives.
8. Chalkones-preparation of some hydroxy-chalkones, their bromination study of the reactivity of the bromo derivations.

BOTANY

1. Studies in Ecology of Mangroves. The Hydrogen Ion concentration of the sea water, soil solution and the leaf cell-sap of the Mangroves.
2. Some observations on the sporelings and adult plants of *Marsilea quadrifolia* Linn.
3. Prothallus of *Lycopodium Hamiltonii* Spring.
4. Silicified plants from Fort Grey, East London.
5. Prothalli of *Ceratopteris*.

6. Professor F. O. Bower.

Z O O L O G Y

1. Insect-pests of Fruits and fruit trees in the Deccan.
2. *Oncidium verraculatum*, cav.

RESEARCH WORK IN PROGRESS (1948-49)

P H Y S I C S

1. Preparation and study of the properties of infra-red photo-cells.
2. Temperature effect of the sensitivity of photographic emulsions.
3. Studies of Fresnel & Fraunhofer diffraction.
4. Mobilities of Gaseous ions.
5. Quantum theory of Radiation.
6. Geomagnetism.
7. Mean free path of electrons in solids.
8. Study of Metastable States.
9. Theory of the liquid state.
10. Behaviour of Metals at supersonic speeds.
11. A. C. Discharge and D. C. Discharge.
12. Spectra of H. F. Discharge.
13. Electron velocity measurements in H. F. Discharge.
14. Spectral study of Hg vapour lamps.
15. C₂ bands in absorption.
16. Determination of molecular weights by surface tension measurement.
17. Relative intensity changes for C₂ and CH bands in discharge through Argon.
18. Quenching of mercury spectrum by the presence of oxygen.
19. Influence of argon on the first positive bands of nitrogen in electrical discharge.
20. Rotational temp. of CH in ethylene flame.
21. Study of the fluorescence of certain complex dye stuffs.
22. Study of Hydride spectra.
23. Controlled excitation of spectra.
24. Probe study of discharges.
25. Spectral study of alcohol flame.

26. Study of under-glycerine spark.
27. Spectral study of combustion in ethylene.
28. Spectral Transformations in discharge through CO.
29. Intensities of scattered light.
30. Solvent effect in dipole moment.

CHEMISTRY

1. Magnetic study of boron compounds.
2. Conductivity measurements of colloidal systems.
3. Magnetic study of amalgams.
4. Scattering of light by sols and gels.
5. Gel systems.
6. Magnetic study of inorganic salts of alkali metals.
7. Phase rule study of soap colloids.
8. Scattering of light of gels.
9. Photo-reduction of ferric chloride.
10. Magnetic study of double salts.
11. Magnetic study of organo-metallic compounds.
12. Magnetic study of hydrates.
13. Manufacture of A. R. Chemicals.
14. Magnetic study of some organic compounds.
15. Manufacture of gelatin.
16. Refining of non-ferrous metals by metallurgical processes.
17. Beryllium and its compounds.
18. Refining of copper by a new method.
19. Reaction between sodium arsenate and mercuric salts.
20. Studies in the preparation of chlorites.
21. Studies in compounds obtained from solutions of titanium dioxide in sulphuric acid on the addition of metallic sulphates along or with hydrogen peroxide.
22. Studies in the reaction of caustic soda on brass.
23. Studies in the reaction between alkali carbonates.
24. Studies in oxidations with perborates.
25. Studies in the reaction of alkaline earth sulphates with lead nitrate.
26. Studies in the corrosion of brass.
27. Studies in the utilization of slags containing antimony obtained from stibnite ore.

28. Potentiometric titration of some inorganic gel forming mixtures.
29. Studies in solutions of zinc hydroxides in alkali hydroxides.
30. Studies in the reactions between lead nitrate and nitrites.
31. Electrometric titrations of some gel forming systems.
32. Nuclear Benzylation of hydroxy ketones.
33. Preparation and reaction of chlorosulphonic acid and preparation of synthetic drugs.
34. Chemical investigation of some indigenous medical plants.
35. A new synthesis of polyhydroxy benzophenones.
36. Synthesis of some nitrochromones.
37. Studies in synthesis of Insecticides.
38. Studies in sulphonation of flavones and isoflavones and addition products of dicarboxylic acids.
39. Studies in Imidochlorides.
40. Action of chlorosulphonic acid on heterocyclic compounds.
41. Preparation of 4-Nitroresorcinol.
42. Studies in sulphinic acids.
43. Substitution in 1-Resorcylic acids.
44. γ -Substitution in Resorcinol Nucleus.
45. Dyes derived from diphenyl-p-aminobenzamidine.
46. Studies in the bromination of coumarins.
47. Studies in Chalkones.
48. Studies in the bromination of coumarins.
49. Molecular rearrangement of o-acyloxy acylarones.

B O T A N Y

1. Flora of Northern Gujarat.
2. Studies in the cytology of ferns and liverworts.
3. Studies on the Anatomy of Palms.
4. Studies on the life histories of ferns and angiosperms.
5. Osmotic pressure of other Mangroves & Halophytes.
6. H-Ion concentration of the cell-sap of other Halophytes.

Z O O L O G Y

1. Food of fishes.

2. Cestodes of some fishes in Bombay.
3. Structure and Bionomics of the Sciaenidae of Bombay.
4. Studies on the ovaries of some marine fishes of Bombay.
5. Studies of the plankton of Karwar and the chemical analysis of sea-water.
6. Comparative study of the Weberian Ossicles of the Siluridae of Bombay.
7. Bionomics of some food-grain pests.
8. Embryology of scorpion.
9. Structure, Physiology and Bionomics of the sea-anemone (*Gyrostome* sp.)
10. Anatomy and Histology of fresh water fish (*Notopterus kapirot*).

RESEARCH WORK PUBLISHED, 1949-50

P H Y S I C S

1. Plausible speed limit for metallic Projectiles (I).
2. An Equation for the comparison of surface tensions by unstable Pendant Drops.
3. A proposed new component of solar radiation.

C H E M I S T R Y

(a) *Physical & Inorganic*

1. Magnetic susceptibilities of some inorganic anions.
2. Scattering of light during the process of formation of gels.
3. Magnetic studies of some hydrates.
4. Dimagnetic susceptibilities of mercuric and mercurous ions.
5. Time of setting of gels formed by the mutual interaction of oppositely charged sols dialysed to different extent.
6. The electrical conductivity of solutions containing zinc hydroxide and potassium hydroxide.
7. Hydrogen ion concentration of solutions containing zinc hydroxide and potassium hydroxide.
8. Effect of an electrolyte on solutions containing zinc hydroxide and sodium hydroxide.
9. Isolation of sodium zincate.

(b) *Organic*

1. γ -Substitution in the resorcinol nucleus. Part VI. Formylation of 4-nitro and 2-nitro resorcinols.
2. Chromones Part I. Nitration of some 7-Hydroxy Chromones and their Methyl Ethers.
3. Some Reactions of Diphenyl-amino-benzamidine.
4. A New Synthesis of α Naphtylacetic acid.
5. Imidochlorides-Part II. Condensation of Benzanilide Imidochlorides with Urethanes: A new Method for the conversion of Aromatic Carboxylic Acids into the corresponding Aldehydes.
6. Imidochlorides Part III. Reaction of Anilide Imidochlorides with Ethyl sodiocitoacetate Synthesis of 4-Hydroxy-2-nyl-3-acetyl-quinilines.
7. Imidochlorides Part III. Reaction of Anilide Imidochlorides with Ethyl Sodiomalonate. Synthesis of some 4-Hydroxy-2onyl-3-carbethoxy-quinolines.
8. Nitration of some Coumarin Derivatives.
9. Addition Products of Anils with some metallic chlorides.
10. A Modified Method for the Esterification of some polyhydroxyaromatic acids.
11. Chromones Part II. Molecular Rearrangement of Acyloxyacetoarones. Synthesis of chromones.
12. Bromination of Coumarins Part I. Bromination of 7-Hydroxy-4-methylcoumarin-6-carboxylate, 7-Hydroxy-4-methylcoumarin-6-carboxylic acid and their Methyl Ether.
13. Bromination of Coumarine Part II. Bromination of 6-Hydroxy-4-methylcoumarin and its Methyl Ether.
14. Synthesis Insecticides Part I. Synthesis of α, α ,-Bis (Aryl) β, β, γ -trichloro-n-butanes.
15. A New Synthesis of 4-Hydroxy-2-phenyl-3-acetylquinoline.
16. Synthesis of Saccharin from Anthranilic acid.
17. Friedel Crafts Acylation of Methyl β -resoreylate. A New and Convenient synthesis of 2-Acetyl-resorcinol.
18. Preparation of m-Nitrophenyl salicylate and some Aryl Esters of 5 and 3-nitro-salicylic acids.

19. Bromination of Compounds containing two Aromatic Nuclei Part III. Bromination of Aryl Esters of salicylic acid.

B O T A N Y

1. Studies in the Ecology of Mangroves. V. Chemical Factors of Mangrove Soils.
2. The laticiferous system of *Regnellidium diphyllum*, Lind.
3. Some New Fossil plants from the *Tertiary Deccan Intertrappeans*.

Z O O L O G Y

1. The Marine Pelecypoda of Bombay.
2. Head Capsule and Mouth parts of *Ctenocephalides felis*, Bouche.

RESEARCH WORK IN PROGRESS 1949-50

P H Y S I C S

1. Preparation and study of the infra-red photocells.
2. Photographic emulsions.
3. Studies of diffractions.
4. Mobility of Gaseous ions.
5. Geomagnetism.
6. Mean free path of electrons in solids.
7. Study of metastable states.
8. Theory of Liquid state.
9. Cosmic rays.
10. Joshi effect.
11. Solvent effect in Dipole moment.
12. Study of H. F. Discharge in Hydrogen (Spectral).
13. Study of H. F. Discharge in Hydrogen (Probe).
14. Mechanism of the production of C_2 bands.
15. Theoretical and experimental study of the Pendant Drop method of surface tension.
16. Study of the surface tension by Sessile Drop.
17. Excitation of Carbon molecular spectra in neon gas.
18. Influence of Oxygen on Nitrogen band spectra.
19. Influence of argon on Nitrogen bands.

20. Rotational Temperature of CH in Ethylene Flame.
21. Study of Fluorescence.
22. Study of Oxyacetylene Flame.
23. Study of Fluorescence of certain complex dyestuffs.
24. Excitation of carbon band spectra in helium.
25. Band spectra of certain oxides.
26. Spectral study of alcohol flames.
27. Probe study of Discharge.

C H E M I S T R Y

(a) *Inorganic & Physical Chemistry*

1. Studies in soap gels in nonaqueous media.
2. Scattering of light by inorganic gels.
3. Photo reduction of Ferric Chlorides.
4. Magnetic study of hydrates and salts containing ammonia of crystallization.
5. Magnetic study of double salts.
6. Magnetic studies in adsorption.
7. Magnetic study of alkali salts in solution.
8. Magnetic study of organic substances in solution.
9. Magnetic study of organo-mercury compounds.
10. Phase rule study of soap colloids.
11. Gels systems in non-aqueous media.
12. Syneresis of gels.
13. Magnetic study of Hydrates.
14. Magnetic study of of organo-arsenic compounds.
15. Magnetism and molecular structure of some organic compounds.
16. Manufacture of A. R. Chemicals.
17. Beryllium and its compounds.
18. Refining of copper by new method.
19. Reaction between sodium arsenate and mercuric salts.
20. Studies in the reaction between alkali sulphates and alkali carbonates.
21. Analysis of mixture containing alkaline earths.
22. Studies on the action of alkaline liquids on brass.
23. Studies in the recovery of antimony from slags.
24. Studies in the preparation of ultramarine.

25. Studies in the preparation of lead oxide.
26. Studies in solutions of zinc hydroxides in alkali hydroxides.
27. Potentiometric titrations of some inorganic gel forming mixtures.
28. Studies in the reactions between lead nitrate and nitrites.
29. Physico-chemical studies of the solutions of compounds containing zwitter ions.

(b) *Organic Chemistry*

1. Chemical investigation of some indigenous medicinal plants.
2. Synthesis of some nitrochromones.
3. A new Synthesis of polyhydroxy benzophenones.
4. Studies in Pechmann condensation.
5. Studies in Chromones.
6. Action of chlorosulphonic acids on heterocyclic compounds.
7. Studies in synthetic insecticides.
8. Studies in sulphonylchlorides.
9. Studies in Imidochlorides.
10. Substitution in Resorcinol Nucleus.
11. Studies in the Bromination of Coumarins.
12. Constitution of the yellow colouring matter from the roots of *pestimeri indica*.
13. Studies in Elb's persulphate oxidation.
14. Studies in formylation.

B O T A N Y

1. Autecology of *Amaranthus spinosus*.
2. Effect of growth hormones on germination of Nitrophelous plants.
3. Classification of the vegetation of India and Burma according to effective precipitation.
4. Ecological survey of the Kanheri National Park.
5. Nitrophily in relation to Nitrification.
6. Absorption of ions by Mangrove plants.
7. Respiration of Mangroves.
8. Autecology of chenopodiaceal.
9. Buffer-index values of Nitrophelous plants.

10. Ecology of calcareous flora of Bombay.
11. Studies in Nitrite Bactena.
12. Study of the cytology and anatomy of Ferns.
13. Anatomy of palms.
14. Studies in the Anatomy, Cytology and life histories of ferns, liverworts and Angiosperms.
15. Viability of seeds of *Pepreromia* sp.
16. Osmotic Pressure of other hylophytes.
17. H-ion concentration of other hylophytes.
18. Study of pollen-grains of some flowering plants.

Z O O L O G Y

1. Food of Fishes.
2. Cestodes of some marine fishes in Bombay.
3. The Biology of *Coillia dussumieri*
4. A study of marine prawns.
5. Structure and Bionomics of Sciaenidae of Bombay.
6. Structure and Bionomics of the cat-flea.
7. Comparative study of the Weberin ossicles of the Siluridæ of Bombay.
8. Plankton of Karwar with observations on physical, chemical and meteorological conditions.
9. Bionomics of some food-grains beetle pests.
10. Studies on the Isopods of Bombay waters.
11. Embryology of Scorpions.
12. Anatomy and Histology of *Notopterus kaporat*.
13. Studies on the Copepods of Bombay waters.

ST. XAVIER'S COLLEGE, BOMBAY.

INDIAN HISTORICAL RESEARCH INSTITUTE

RESEARCH WORK COMPLETED.

1. The Shahi Rulers of Udabhandapura.
2. British Missions to Sind in the 19th Century.
3. The Story of the Proto-Indo Mediterranean Buildings, their Origin, Significance and Influence.

C H E M I S T R Y

1. A New method of diazotising the aromatic current Science.

2. The constitution of the compound by formaldehyde with sulpha-thiazole.

M A T H E M A T I C S

The Theory of Potentials.

B O T A N Y

1. On the Embryology etc. of the Umbelliferae.
2. On the Dipterocarpaceæ of India.
3. The Flora of Khandala on the Western Ghats of India.
4. The Flora of Purandhar.
5. Revision of the Acanthaceae of Bombay.
6. Novitates Bombaienses.
7. Inter Kathiawarensis - being notes on a botanical tour in Nawanagar State.
8. Artificial Key to the Papilionaceae of Bombay.
9. Notes on the Gesneraceae of Bombay.
10. Notes on the Scrophulariaceæ of Bombay.
11. The genus Ceropegia - Still further comments.
12. The Medicinal Leguminosae of India.

M I C R O B I O L O G Y

1. A contribution to the studies on the microbiology of preserved food.
2. Studies on a new oxalate-decomposing bacterium, *Vibrio oxalitycus*.
3. Chemical and microbiological studies on *mawa*.
4. Studies on the influence of some bacterial cultures in the Nitrogen Status of Soil.
 - a. The influence of *Bacillus subtilis* in the Nitrogen Status of Soil.
 - b. The influence of *Serratia marcescens* in the Nitrogen Status of Soil.
5. Studies on the suitability of sugar-cane juice for the growth and distribution of some pathogenic bacteria.
6. Water-melon and Food-poisoning. The viability of the test bacteria in the juice.
7. Experimental Production of Dental Caries.

8. Fate of some intestinal pathogenic bacteria in *dahi*.
9. The Microbiology of indigenous Pickles and Preserves.
10. Microflora of *Ghee*.
11. Optimum temperature for *Ghee*-making.
12. Some fruit fungi and hydrolysis of starch.
13. The possible association of coliform bacteria with *C. lactoacetophilum*.
14. The role of *Staphylococcus citreus* in the Nitrogen Status of Soil.
15. The role of acetic acid or acetyl derivatives in the synthesis of higher fatty acids by certain anaerobic bacteria.

CAIUS RESEARCH INSTITUTE

1. A new drug 'Formo-sulphathiazole' and the treatment of Cholera.
2. Drug action of Formaldehyde derivatives of sulphathiazole.
3. Chemical structure of the condensation product of formaldehyde with sulphathiazole.
4. Formaldehyde derivatives of sulphathiazole. New mechanism of drug action. (Chemistry, Chemotherapeutic activity and Pharmacology).
5. Treatment of Typhoid fever with formaldehyde derivatives of sulphathiazole.

WILSON COLLEGE

BIOCHEMISTRY

1. Seasonal variation in (a) Vitamin A content and (b) some of the physical and chemical constants of some Fish Liver Oils (*Proc. Indian Academy Sci.*, 39, 13, 1949).
2. Studies in the Biological Assay of Vitamin A content of some of the liver oils (*Proc. Ind. Acad. Sci.*, 1949).
3. B-carotene content of some edible and non-edible green leaves by making use of petroleum ether as a solvent and freshly ignited Calcium Oxide as an adsorbent for Carotenoids other than Carotene.
4. Study of the suitability of B-Carotene in edible oils like

groundnut oil, cocoanut oil, hydrogenated oil sesame oil and *Ghee*.

5. The effect of germination on the nutrititional qualities of some of the vegetable proteins.

P H Y S I C A L C H E M I S T R Y

S T U D I E S I N C O L L O I D S

1. Dialysis of Ferric hydroxide sol.
2. Hydrolysis of ferric salt solutions.
3. Activation of fuller's earth.
4. Measurement of cataphoretic speed, conductivity and stability of Colloidal Aluminium hydroxide, Uranium ferrocyanide and Prussian blue with progress of dialysis.
5. Mutual coagulation of colloidal solutions of Aluminium hydroxide and Prussian blue and Aluminium hydroxide and Uranium ferrocyanide at various stages of dialysis.
6. The Kinetics of reactions between Potassium persulphate and potassium iodide in presence of colloidal solutions of gelatin, agar-agar, gum tragacanth and gum acacia under varying conditions.

H I S T O R Y

“Christ and Western India”—A History of the development of the Church from 1813 to the present time.

E N G L I S H

The Plan and Teaching of English Language and Literature in Indian Universities.

S A N S K R I T

1. Drama Themes of Bhasa.
2. Origin and Development of Yoga in Vedic Literature.

ELPHINSTONE COLLEGE, BOMBAY

S A N S K R I T

1. Atharvaveda - its mythology, religion and philosophy.
2. The Mahabharata - its authorship and philosophy.

3. Hindu Society in classical Sanskrit Literature.

G U J R A T I

Ramanbhai - a study.

RAMNARAIN RUIA COLLEGE, BOMBAY

Z O O L O G Y

1. The Marine Pelecypoda of Bombay.
2. Four New Species of Parasitic Copepoda from the Marine fishes of Bombay.
3. A New Caligid Copepod parasitic on the fish *Clupia toli*.
4. Fat Content of the Muscles of some Marine fishes of Bombay.
5. Two New species of Hatschekia Parasitic on Bombay fishes.
6. Fat constants of the Body oils of some Marine fishes of Bombay.
7. A Note on the transfer of *Caligus formicoides* to the genus Parapetalus.

SIDDHARTHA COLLEGE, BOMBAY

C H E M I S T R Y

1. Synthesis of New Beta aryl glutaconic acids & esters.
2. Investigation on C acylation of Beta-Naphthyl-Glutaconic and anhydrides.
3. Investigation on the dispersion of Sodium Oleate in some Organic solvents and the study of various properties of Gels of the soap in these solvents.
4. Studies on Lipase from oil seeds. General study of the ricinus lipase from castor seeds.
5. Studies on Lipase from oil seeds. Synthesis of some aliphatic esters by ricinus lipase from castor seeds.
6. Studies on Lipase from oil seeds. Effect of hydroxyl groups in alcohol on the synthesis of esters by lipase.

P H Y S I C S

Theoretical investigation on geophysical control of magnetic variations (Diurnal) of earth's magnetic field.

B O T A N Y

The Cytology of magneliaceæ.

Z O O L O G Y

Quantitative determination of Thiamin in Genedes and fishes.

S A N S K R I T

1. Study of Indra legends from the Satapatha Brahmana.
2. Vidushaka in Sanskrit drama.

P H I L O S O P H Y

1. A comparative study of the Philosophy of Shankaracharya.
2. Life of Tukaram.

G U J R A T I

1. "Vivid Sahitya Swarupe".
2. "Narmat ane Dalpat" — a work dealing with their lives, and literary works and their influence on modern Gujarat as poets, pioneers and reformers.

E N G L I S H

1. Walter Pater - Man and Artist.
2. W. Somerset Maugham - a critical study.
3. Mulk Raj Anand : Novelist and Story Writer.

BHARATIYA VIDYA BHAVAN, BOMBAY 7.

1. Paumacariu.
2. Sringaramanjari.
3. Padartha Tattva Nirnaya.
4. Critical Edition of Kavi Kalpalata.
5. Text of Inscription during Vakatakas.
6. Raje - a study.
7. Dayaram.

MEGJI MATHRADAS ARTS COLLEGE & NARRONDASS
MANORDASS INSTITUTE OF SCIENCE,
ANDHERI, BOMBAY.

ARTS

ENGLISH

1. The Contribution of Sri Aurobindo to Indo-English Literature.
2. A. E. Houseman.
3. Indian Contribution to English Poetry.
4. Somerset Maugham — A Critical Study.
5. Mysticism of Francis Thompson.
6. Indian Contribution to English Literary Criticism.
7. The mind and art of Eugene O'Neil.
8. Expression of Personality in Literature.
9. H. G. Wells as a writer, with special reference to his Scientific Romances.
10. Cavalier Poets — their heritage and legacy (under Charles I and the Commonwealth).
11. Metaphysical Poets — (under Charles I and Commonwealth) and their influence on Modern Poetry.
12. T. S. Eliot — his Poetry and Art.
13. Disintegration of the Novel in English Literature.

SCIENCE

BIOLOGY

1. Embryological studies in the families :—
Anonaceæ, Rutaceæ cucurbitaceæ, Euphorbiaceæ, vitaceæ, Taccaceæ, Dioscoreaceæ, Typhaceæ, Umbelliferæ.
2. Anatomical studies in the families - convolvulaceæ and solanaceæ.

ISMAIL YUSUF COLLEGE, JOGESHWARI

PERSIAN

Zoroastrians and their Fire-Temples in Iran and adjoining countries during the 11th, 12th, 13th and 14th centuries as gleaned from the Arabic Geographical Works.

HISTORY

Some controversial aspects of the Temple of Somnath.

SANSKRIT

1. Varuna in Rigveda.
2. The Imperfection of the Sakalaka Recension of the Rgveda Samhita.
3. The Nature god Diti in Rgveda.
4. The Varuna Hymns in the Rgveda.
Translated and annotated.
5. Is the Rgvelic Rudra a 'Howler' ?
6. Two Articles entitled "Vedic Rituals" and "The Vedangas".
7. A Problem presented by the word Svaghnin in the Rgveda.
8. The Path of Bhakti in the Rgveda. (In Marathi).
9. The Name Indra — an Eymological Investigation.
10. Indra as the God of Light in the Rgveda.
11. Early Literature presupposed in the Mahabharata.
12. The ritual presupposed in the Vedic Samhitas.

SECONDARY TRAINING COLLEGE, BOMBAY

Education in Gujarath. Its past, present and future.

SYDENHAM COLLEGE OF COMMERCE & ECONOMICS.

BOMBAY

1948-49

1. Industrial Finance in India.
2. Industrial Relations in India.
3. A study of the Kanara Peasant (Survey of a Kanara Village).
4. A study of the Indian Money Market.
5. Cottage Industries in India.
6. Business Administration & Managements in India.
7. Agricultural Finance in India.
8. Money & Prices in India—1890 to 1945.

1949-50

1. Industrial Labour Problems.

2. Yarn and Yarn Markets in India.
3. Life Insurance Principles & Practice.
4. The Law of Insurance Management.
5. Organisation of the Co-operative Movement in India.
6. Taxation in India (with special reference to the Province of Bombay).
7. Standardised Accounting.
8. War Finance : A study in Methods.
9. Land Tenure and Tenancy in India.
10. Booms and Depressions in the Indian Economy.
11. Banking During War and Peace.

1950-51

1. War-time Development of Indian Industries.
2. Central Finances during and after the Depression.
3. Problems of Agricultural Reorganisation in India.
4. Labour Exchanges.
5. Modern Developments in Accounting and Costing.

SETH G. S. MEDICAL COLLEGE, PAREL, BOMBAY 12.

1. Anæmia
2. Pheage Typing of Salmonella Straine.
3. Anaemias in Ankylostomia as.
4. Age Changes in Arteries.
5. The Standardisation of Indian-made Liver Extracts.
6. The Etiology of Idopathic Hydrocele.
7. Erythropœsis in Cooley's anaemia.
8. Fat metabolism.
9. Mode of action of Vitamin D.
10. Analysis of Foodstuffs.
11. Some aspects of Carbohydrate metabolism with special reference to studies on the Islets of Langerhans.
12. Calcium and Phosphorus metabolism.
13. Research on "Rickets.
14. Analysis of local food stuffs for Vit. B. Complex.
15. Study of the nutritional influences on the production of cancer by chemicals.
16. The effect of season on the Vit. B. Complex metabolism in Sea Fish.

17. The effect of some vegetable proteins on plasma proteins.
18. Immunological properties of lens and uveal proteins.

G. T. HOSPITAL, BOMBAY

1. Study of Surgical aspect of Peptic Ulcer.
2. Observations on Cirrhosis of Liver.
3. Observations on effect of Penicillin in Tetanus.
4. New Operative treatment of Ascitis.
5. Work on Anaemia.
6. Typhus Fever.
7. Stelate Ganglion block in central thrombosis & embolism.
8. Observations on Cardiac Diseases at J. J. Hospital, Bombay.

SIR C. E. M. DENTAL COLLEGE AND HOSPITAL, BOMBAY

1. Incidence of Dental Caries in School Children in Bombay.
2. Incidence of gingivitis in School children in Bombay.
3. Incidence of salivary calculus in School children in Bombay.
4. The pH of normal resting saliva.
5. The pH of saliva at various intervals in the day.
6. The day to day variations in the pH of saliva.
7. The pH of stimulated saliva collected under paraffin oil.
8. The pH of stimulated saliva collected direct.
9. Effect of sodium hexa meta phosphate in disintegrating the calculus and thereby improving gingivitis and periodontal diseases.

BOMBAY VETERINARY COLLEGE

BACTERIOLOGY

1. Flora of wounds and abscesses and pathogenic role of *C. pyogenes* in animals.
2. Mastitis in cattle and buffaloes.
3. Chemical and Bacteriological study of Bombay City milk.
4. Nature and diagnosis of Pasturella invasion in the blood circulation of rabbits, cattle and buffaloes.
5. Flora of normal udder.
6. Antigemic structure between different Pasteurella strain.

7. Salmonellosis in fowls and white rats.
8. Contagious Bovine Abortion.
9. Surra in horses and cattle.
10. Combined infection of Haemorrhagic Septicaemia and Black Quarter.
11. Bovine Tuberculosis-Infectivity of milk.
12. Contagious Pleuro-pneumonia of goats.

ANIMAL HUSBANDRY

A study on Cestodes of Marine Food Fishes of Bombay.

PARASITOLOGY

1. Life history of *Thelazia rhodesii*.
2. Life history of *Schistosoma indicum*,
3. The ecology of *Hunterellus hookeri*, a parasite of Ticks
4. Mange in cattle with particular reference to cryptic form.
5. Life cycle of *Parafilaria bovicola*,
6. *Balantidium* sp. in ruminants.
7. *Parafilaria bovicola*.
8. Biological control of Ticks and Tabanids.

PATHOLOGY

1. Amybiid degeneration.
2. Aspergillosis.
3. Osteodpstroghia fibrosa.

GURU NANAK KHALSA COLLEGE BOMBAY No. 19

PHYSICS

Development of atmospheric visibility meter useful for pilots and meteorologists. A formula of heat transfer from special bodies.

MATHEMATICS

Infinite Projective Plane.

CALCUTTA UNIVERSITY

SANSKRIT

'A Study of Bhagavatgita' and an annotated translation of Rigveda.

ECONOMICS

Investigation of conditions and scope of small industries in Gujarat.

CHEMISTRY

Chemical characteristics of Oxides of Nickel from Magnets *Journal of India Chemical Society* 1934).

PHYSICS

1. Variation of Visibility in Bombay and Poona (*Indian Journal of Meteorology*).
2. Evaporation from special Surfaces. (*Indian Academy of Science*).

MATHEMATICS

Central Points and Parameter of Distribution. (*Journal of the Bombay University*-1950).

ECONOMICS

1. Kathiawar Economics and Wealth of Gujarat.
2. Post-war Gujarat.

CALCUTTA

ENGLISH

1. Introduction of English Studies in Bengal.
2. English as Language and as Literature.
3. A Literature of Publicity with special reference to India.
4. Studies in Indian Scripts.
5. Spoken English in India.
6. English as the Language of Administration.

7. Rationalism and Shakespeare Criticism with Special Reference to G. B. Shaw.
8. A study of the Problem Plays of Shakespeare.

P A L I

1. Last volume of the *Mulasarvastivada Vinaya Pitaka* (based on Gilgit MSS).
2. Revised edition of the *Saddharmapundarika* (being published by the Asiatic Society).
3. Completed translation of Taranath's History of Buddhism.
4. The background of Buddhism.
5. Buddhism as a link in the East-Asiatic Culture.
6. Studies in the Pali Commentaries.
7. Final revision of the "Dictionary of Prakrit Inscriptions in India."
8. Buddhakhetta in the Apadana.
9. Pali Grammar, Rhetoric and Prosody.
10. Buddhism as a Rational Religion.
11. A critical account of the Pali books mentioned in the *Gaudhavamsa*.
12. The Sanskrit Pratimoksa sutra, based on Gilgit MSS.
13. Sanskrit version of the Karmavakya.
14. The Vinaya texts in Chinese (*I. H. Quarterly*).
15. The Ceremony of Ordination in China.
16. The Sanskrit Vinaya texts.
17. The Buddhistic influence on the *Kathasaritsagara*.
18. "Significance and importance of the Jatakas"
19. "Democracy in Early Buddhist Sanga"
20. Study on the Mahayana Literature.
21. A comprehensive study of the following works completed :—
 Different Prajnaparamita-sutras.
 Arya-Ganda-vyuha-Mahayana Sutra.
 Dasabhumika-Mahayana Sutra.
 Lankavatara-mahayana Sutra.
 Tathagata-Guhyaka-Mahayana Sutra.
 Saddharma-pundarika-Mahayana Sutra.
 Rastrapala-pariprecha.
 Narayana-pariprecha.
 Nairatmya-pariprecha.

Arya-Karanda-Vyuha.
 Kasyapa-parivarta.
 Sukhavati-vyuha.
 Buddha-ksetra-sandarsana-vyuha.
 Maitreya-vyakarana.
 Sri Mahadevi vyakarana.
 Ajitasena vyakarana.
 Sandhi nirmocana sutra.
 Karuna pundarika nama Mahayana sutra.
 Arya Bhaisajya guru nama Mahayana sutra
 Ekadasa mukha hrdaya.
 Hayagriva vidya.
 Arya Tara Sragdhara stotra.
 Adikarma pradipa,
 Buddha-veda.

B E N G A L I

1. Some Geographical and Topographical accounts of Bengal.
2. Editing of the oldest Chandikavya, named Manik Datta's Chandikavya.
3. Sakta influence in the evolution of the Vaishnava Theology.

ANCIENT INDIAN HISTORY AND CULTURE

1. Reading of Dates on Western Kshatrapa coins.
2. 'Religious Movements—Brahmanical Sects, for Vol. III of the History of India in the course of publication by the Indian History Congress.
3. Archaeology and some Brahmanical cults in the Indian Museum.
4. The walls of Orissan Temples. (*Journal of the Indian Society of Oriental Art*, Vol. XV).
5. A Survey of Indian Art.
6. Third Edition of 'Vishnudharmattari'.
7. Second Edition of Indian of Indian Sculpture (Oxford University Press—under preparation).
8. Buddhism in India after 1000 A. D. to the Fifth Volume of the History of India which is being edited by Dr.

R. C. Majumdar and published by the Bharatiya Vidya Bhavan of Bombay.

9. Early Bengal's Contributions to Indian Philosophical System.
10. Buddhism in Kamarupa.
11. History of the Imperial and Later Guptas.
12. Orissan Arts and Crafts.
13. Ancient Indian Minor Arts including pottery, textiles, jewellery, etc.
14. Jewellery in Taxila
15. Early Indian Sculpture.
16. Minor Arts in Bengal.
17. Investigation, with the help of original sources in Tibetan and Chinese of the pre-Buddhistic religion of Tibet usually known as the Bon faith.

E C O N O M I C S

1. Devaluation and the Dollor Problem.
2. The Industrial Finance Corporation of India—A Brief critical study of the first year of its working.

P O L I T I C A L S C I E N C E

1. Dr. Katju and the Separation of the Executive and Judicial Functions: A Crititique.
2. Indian States and the Future Constitution of India.
3. Can Democracy Function in a One Party State?
4. Some Problems of West Bengal.
5. Panchayat Raj in U.P.

P H I L O S O P H Y

1. Introduction to Indian Logic.
2. Five Schools of Vaishnavism.
3. Existentialism.
4. Logic as Metaphysis.
5. The Problems of Philosophy.
6. Sri Aurobindo and the Fundamental Contradiction in Human Life. (*Calcutta Review*, December, 1949).
7. Mahatma Gandhi: A Study in his Philosophy. (*Modern Review*, January, 1950).

8. Sir Brajendranath Seal: A Landmark in Philosophical Studies in India (*The Hindustan Standard*, December 11, 1949).
9. The Identity of an Object.
10. Sri Ramkrishna: A Study in his Life and Philosophy.
11. Theories of Relation (a chapter incorporated in the book 'Object, Content and Relation').
12. The Concept of Universal.
13. Reality as the Concrete Universal.
14. Things and Relations.
15. Knowledge by Identity and Reason—published in the Calcutta Review.
16. The Awareness of Ignorance.

POST-GRADUATE TEACHING IN SCIENCE

A P P L I E D M A T H E M A T I C S

1. The Problem of Fitting of a Radiative Stellar Envelope to a Convective Core (*Proc. Nat. Inst. Sci. India*, 15, 25, 1949).
2. The Possibility of Fitting of Convective Cores of different Compositions to a Given Envelope Solution of the Stellar Equations (*Proc. Nat. Inst. Sci. India*, 15, 269, 1949).
3. Abel-Convergent Integrals and their Application to Mathematical Physics (*Bull. Cal. Math. Soc.*, 41, 143, 1949).
4. Imperfect Gases after Fermi's Model, III (*Proc. Nat. Inst. Sci. India*).
5. An Extension of Hamy's Theorem to Rotating Gaseous Bodies—*Bull. Cal. Math. Soc.*, 41, 92, 1949.
6. Gases with a Pressure-Density Relation—Impossibility of Confocal Density Distribution (*Bull. Cal. Math. Soc.*, 41, 183, 1949).
7. Torsion and Flexure of an Isotropic Elastic Cylinder whose Cross Section is a Semi-Cardioid (*Bull. Cal. Math. Soc.* 41, 28, 1949).
8. Flexure Functions of a Semi-Circular Cylinder (*Bull. Cal. Math. Soc.* 44, 125, 1949).
9. The Flexure Problems of a Limacon and some other Boundaries (*Bull. Cal. Math. Soc.* 41, 153, 1949).

PURE PHYSICS

1. Work on Soft X-Ray Spectroscopy Solids.
2. On the Luminescence of Solids.

The following papers have been communicated :—

1. $L_{2,3}$ valence band spectra of magnetic and non-magnetic Iron compounds and alloys.
2. Soft X-ray Spectra of Alkali-halides.
3. Energy states of valence, Electrons of MgO , Al_2O_3 , SiO_2 .
4. Valence band shift and Heat of formation of chemical compounds.
5. 3d, 4s, q band structure of Iron-group alloys.
6. Luminescence spectra of Alkali Halides (*Nat. Inst. Science* Vol. XVI, 1950, Page 47).
7. X-ray luminescence spectra of some Alkali Halides.
8. The association of Germanium with magnetic material.

APPLIED PHYSICS

1. Dielectric Properties of Indian Mica and Indian Vegetable Oils.
2. Study on A. C. Motors.
3. Spectra of Heavy Diatomic Molecules.

PURE CHEMISTRY

1. Imperfect complexes in solution.
2. Mineral Chemistry.
3. Chemistry of Rare-earths and rare-elements.
4. Fluorescence Analysis.
5. Spectrographic study of Indian Minerals.
6. Extraction of Thorium Nitrate and Phosphoric Acid from Monazite Sands.
7. Extraction of Uranium from low grade Uranium Ores.
8. Search of trace elements in Indian Coal Ash.
9. Determination of Germanium in Indian Coal Ash.
10. Investigation on the chemical composition of Radio-active minerals.
11. Determination of the Geological age of Indian radio-active minerals from the Lead : Uranium ratio.

12. Extraction of Lead (as Lead Iodide) from Radio-active minerals from the mass spectrographic estimation of isotopic constituents of Lead.

The following papers were published :

1. Cathodo-Luminescence of Rare Earths in Coal-Ash.
(*Nature*, Vol. 103, 1949, 402 p. March).
2. Germanium in Indian Coal Ash.
(*Science and Culture*, Vol. 14, 1949, 538 p. June).
3. Gallium in Indian Aluminium.
(*Science and Culture*, Vol. 14, 1949, 296 p. January).
4. On the nature of complex formation between cupric ion (Cu^{+2}) and pyrophosphate radical ($\text{P}_2\text{O}_7^{-4}$).
(*Science and Culture*, No. 8, Vol. 14, 1949) 340.
5. Estimation of Beryllium in Indian Beryls by the Fluorometric method. (*Proc. 37th Ind. Sc. Cong, Part III, Abstract 169, 1950*).
6. A new method for Estimation of Copper and Zinc in Brass.
(*Science and Culture*, July, 1949).
7. The Ferric Thiocyanate Paradox.
Science and Culture, November, 1949.

The following papers were considered :

1. Investigation on Indian Radio-active minerals.
2. Samarskite. (Accepted for publication in the Journal of Scientific and Industrial Research).
3. Allanite. (Accepted for publication in the Journal of Scientific and Industrial Research).
4. Monazite (Accepted for publication in the Journal of Scientific and Industrial Research).

Research activities in the Laboratory of the Palit Professor of Chemistry :

1. "Complex Compounds of beguanide with bivalent metals, Part X. Two modifications of copper N-diethylbiguanide. Journal of Indian Chemical Society, 1949.
2. A study on the stability of the complex compounds of trivalent cobalt with biguanide and phenyl biguanide.
3. The isolation of the optical isomers of cobaltic-tri-phenyl-biguanide and the determination of their optical activities.

4. Complex compounds of bivalent metal like Cu_2 , Ni_2 and Co_2 with piperazine dibiguanide and thiodicyandiamidine (Guanyl thiourea).
5. The action of amino acids on the complex compounds of the bivalent metals like Cu_2 , Ni_2 and Co_2 salicylaldehyde—isolation of the products and the determination of their magnetic susceptibilities.
6. Synthesis of a new series of substituted biguanide and isomeric dicyandiamidines of therapeutic interest.
7. A study on the velocity of decomposition of the complex compounds of trivalent silver with ethylene dibiguanide.

APPLIED CHEMISTRY

Under the Ghose Professor :

1. Recovery of Titanium from Bauxite.
2. Extraction of Alumina from Indian clay by acid process.
3. Decarboxylation of fatty acids.
4. Oxidation of Glycerine to formaldehyde.
5. Dry hydrolysis of starch.
6. Rancidity of Fats.
7. Preparation of p-amino-salicylic acid.
8. Sulphoxides and their homologues.
9. Condensation of chlorate with d-aniline.
10. Fermentative Production of Citric acid.
11. Microbiology and cereal grains.
12. Jute Plastics.
13. Fortification of Vegetable Ghee.
14. Bio-synthesis of Vitamin C.
15. Activation of Gangetic silt.
16. Infra-red drying of paddy.
17. Modification of Molasses.
18. Crystallisation of Sucrose.
19. Co-relation of CO_2 —activity of coke with ash content.

PHYSIOLOGY

1. Ascorbic acid contents of Garden Rose Hips (published in *Indian Journal of Physiology and Allied Sciences* Vol. 1 No. 1).

2. Effect of germination, autoclaving and dry heat treatment on the Biological value of *Cicer Arietinum* L (gram) and *Phaseolus Aureus* Roxb (sona mug)—*Indian Journal of Physiology and Allied Sciences* Vol. III, Nos. 1 and 2, July, 1949).
3. Low temperature fractionation of different fats and their Role in Ca and Mg absorption.
4. Effect of Neproline (a new alkaloid) on heart and muscle of frogs and mammals.
5. Influence of Dietary Protein on Scurvy.
6. Influence of light, temperature and food on Pituitary and other Endocrine glands and their relation to colour changes of some Indian teleostean fishes.
7. The effect of some drugs on circulation, respiration and nervous system.

The following research papers were published during 1949 :

1. Effect of procuring on the Biological value of Protein. (*Indian Journal of Physiology and Allied Sciences* 1949).
2. Nutritional evaluation of triglyceride fraction of natural and processed fat.
3. On the Intimate nature of the action of Cobra Venom on muscular contraction.
4. Effect of Vit. C deficiency on protein utilisation and plasma protein.

B O T A N Y

1. The Cytological Aspects of the Nature of Sex in Plants. *The Ceylon Journal of Science*, Section A. Botany, Vol. XIII, 1949.
2. Cytology of Apospory and Apogamy in *Doodi aspera*. Proceedings of the 37th Indian Science Congress.
3. The Cytogenetics of Cultivated Jesmines—Proceedings of the 37th Indian Science Congress.
4. Cytogeneticist in the Scheme "Breeding of Improved Types of Banana"—Breeding of Improved Types of Banana, Annual Report 1949, Indian Council of Agricultural Research.

5. Artificial culture of embryo and study of factors influencing in the successful growth of the embryo in synthetic media under tropical conditions. Annual Report, Indian National Institute of Sciences, 1949.
 6. On the double flowers of *Eryatania divaricata* L. Bulletin, Bengal Botanical Society, Vol. II, No. 1, 1949.
 7. The Inter-relationships of Water Content and Carbohydrate Concentration in Barley. *Bulletin of the Botanical Society of Bengal*, Vol. 2, No. 2, 1949.
 8. A study of Microfossils and the correlation of some productive coal seams of the Raniganj coal-field. Trans. Min Geol. and Met. Inst. India, Vol. 43, No. 2, July, 1948, pp. 67-150 (with 136 figs.)—Published in Oct. 1949.
 9. Microfossils from Assam coal-fields I. The Coal seams at Laitryngow and the age of the Chera Sandstone. *Bull. Bot. Sec., Bengal*, Vol. 2, No. 2, Oct. 1948, pp. 1-11. Published in 1949.
 10. The occurrence of *Cordyceps sphecocephala* (Ki) Sacc. near Calcutta. *Curr. Sci.*, July, 1949, pp. 254-255.
 11. Recent Advances in Micropalæontology and Micropalæobotany, *Sci. and Cult.* June, 1949, pp. 510-517.
 12. X-ray investigation on the change in the orientation of cellulose in sound and infected tracheids of Chir (*Pinns longifolia*). *Science*, February 10, 1950, Vol. 3, No. 2876, p. 151.
- (Sargassums of Indian Seas. Journal of Asiatic Society of Bengal To be published shortly).

G E O L O G Y

1. Study of ore minerals by the new contract print method. (Communicated to the Indian Science Congress).
2. Carried out coal cleaning experiment with some Indian Coals. (Ready for publication).
3. Carried out researches in coal petrography in the new line with photometre.
4. Fossiliferous lime stone of Bhagwi (communicated to the Geological, Mining and Metallurgical Society of India—Quarterly Journal, Vol. XX, No. 4).

5. Shape analysis of quartz and grains in some Gondwana sandstones. (Science and Culture, Vol. 14, May, 1949).
6. Some examples of quartz grain orientation in tectonites and non-tectonites. (Current Science, September, 1949).
7. Structural Petrology of wall rocks of porphyritic granite (Manbhum). (Quarterly Journal, Geological, Mining and Metallurgical Society of India, Vol. XXI, No. 2).
8. Completed the Structural mapping of granite and wall rocks of E. Manbhum and engaged in the research work in sedimentation in Gondwana basin of Raniganj coal-field.
9. Para-amphibolites and associated calc-silicate rocks near Pathorgora, (Science and Culture, February, 1949).
10. Engaged in the study of sedimentation in Gondwana basin Raniganj Coal field and in the matter of correlation of shape with different mass properties of sedimentary rocks.
11. The study of microflora in coal and carbonaceous shales of the Jharia Coalfield.

Z O O L O G Y

1. The Embryology of the vertebrates and also on the life-history, and biology of food fishes.
2. Published important papers on termites of Bengal. He had been carrying researches on entomology, *bruchidae*, *formicidae*, and *termitidae*.
3. Published a paper on the cervical and thoracic blood vessels in the Northern Indian Green Barbet.
4. Published papers on pregnancy diagnosis test in human cases and in cattle.
5. Nematode worms.
6. Termite flagellates and coccidian parasites in Birds, Reptiles and Amphibians.
7. Published a paper on cytological studies on the Indian Dragon flies.
8. Effects of X-Rays on meiotic chromosomes of grasshoppers sanctioned by the National Institute of Sciences of India.
9. Life-history, autonomy and histology of fishes.

II

G E O G R A P H Y

1. Natural resources and their conservation.
(Science and Culture)
2. Geographical aspects of food problems.
(Bose Institute Publication)
3. Geography of Calcutta and 24-Parganas.
(Published as a Research Monograph in Bengali).
4. Problems of Human Geography. (Calcutta Geographical Review, March 1949).
5. Adaptation to Environment. (Calcutta Geographical Review, June, 1949).
6. Disintegration of tribal cultures in India (Calcutta Geographical Review, September-December, 1949).
7. Geographical study of the Bengal—Bihar Industrial Belt.
(Calcutta Geographical Review, June, Sept.—Dec., 1949).
8. Land utilisation in some villages near Jasidih, Deogarh.
(To be published in the next issue of Calcutta Geographical Review).
9. Climostatical investigation of the climatic types of India.
(To be published shortly).

S T A T I S T I C S

1. Testing of hypothesis.
2. Systematic sampling Topographic variation and Sample Surveys and
3. Construction of Statistical tables.
4. A test of field uniformity by space correlation method and showing its limiting distribution under certain conditions tending to the normal form.
5. The problem of combination of tests of significance and the optimum properties of conditional tests of significance.
6. Multivariate analysis and canonical correlations.
7. Investigation of the various types of systematic sampling from a two dimensional field with interesting results.
8. Study of topographic variation and the related problems of sample survey.

9. An upper limit for the expected length of the shortest path among n -points in a two dimensional field—an useful result in cost analysis of sample surveys.
10. On the classical and studentised D^2 —statistic. (Published a new set of tables for the studentised D^2 —statistic which are very useful for practical problems. In classical D^2 , investigation is proceeding for finding out the points for which the distribution of the statistic may be taken to be identical with the normal curve for different values of the parameters.

LIST OF PAPERS

1. Tables of significant Levels of Studentised D^2 —Statistic—Calcutta Statistical Association Bulletin, 2 (7).
2. On the construction of Incomplete Probability Integral tables of the classical D^2 —statistic—Proceedings of the 37th Indian Science Congress, 1950.
3. Two Dimensional Systematic Sampling—Science and Culture, 15 (4).
4. On Systematic Sampling—Proceedings of the Indian Science Congress, 37th Session, 1950.
5. Submarginal Farming in West Bengal (jointly with A. Ghosh—Indian Journal of Agricultural Economics ; Conference Number, 1950.
6. On Response of Mimosa-Pudica to its organ-extract (jointly with B. Banerjee)—Proceedings of the Int. Biometric Society (India region), 1950.
7. Topographic Variation in Statistical Fields—Calcutta Statistical Association Bulletin, 2 (5).
8. Topographic Randomness and its Statistical Tests—Calcutta Statistical Association Bulletin, 2(6).
9. Multistage Stochastic Model for Natural Fields—Proceedings of the Indian Science Congress, 37th Session. 1950.
10. Interpenetrating (Networks of) Samples—Calcutta Statistical Association Bulletin, 2(7).
11. A test of field uniformity based on the space correlation method—Sankhya, 9 (1).

12. Records and Statistics—Calcutta Statistical Association Bulletin, 2(6).
13. Expected Travel among Random points—Calcutta Statistical Association Bulletin, 2(6).
14. Health & Diet Survey by sampling—Calcutta Statistical Association Bulletin, 2(7).
15. A note on conditional tests of significance—Bulletin of the Calcutta Mathematical Society, 41 (3).
16. A critique of U. P. Anthropometric Survey—Calcutta Statistical Association Bulletin, 2 (7).
17. A note on combination of tests of significance—Proceedings of the Indian Science Congress, 1950.

A G R I C U L T U R E

1. On the economics of dairy management.
2. On the supply of green fodder throughout the year.
3. Observation on the performance of cross breeds (local cows X Sahiwal and Haryana Bull) as dairy animal.
4. Observation on the performance of pure (White leghorn and Rhode island Reds) and cross bred poultry birds.
5. Studies on the Agricultural Economics of West Bengal:—
(1) Soils and scope of West Bengal.

RESEARCHES UNDER STUDENTSHIP

1. Radha Dialects.
2. Homocyclic Compounds.
3. On the nature of complex formation between cuprician (Cu^{+2}) and Pyrophosphate radical ($\text{P}_2 \text{O}_4^{4-}$) and the determination of the instability constants of the complexes in solution.
4. Experiments on Mercapto-thiazolones and Indian Species of Podophyllum.
5. An enquiry into implication and inference.
6. Bishnupada Bhattacharya, Yaska's Nirukta.
7. Studies in Philosophy.
8. Bangali Krishakar Dena.
9. Daemia Extensa Linn.

10. Law of Master and Servant Relations in British India.
11. Jail and Borstal with special reference to India in the London School of Economics. University of London.
12. To study recent lines of development of investigations of tree, timber and crop diseases in England and France.
13. Neru-physiology in connection with Electro-Encephalography in New York University or Michigan University.
14. 'Microwaves and its application to the Molecular spectroscopy' at the Columbia Radiation Laboratory, Columbia University, U.S.A.
15. X-Ray Engineering including Industrial Radiology, London University.

DELHI

BOTANY

Studies in the Embryology of the Graminal ; Studies in the morphology and embryology of the loranthecease.

CHEMISTRY

Organic Chemistry ; Physical Chemistry.

PHYSICS

Meson Theory ; Optics ; Nuclear Physics - Reactions with Neutrons ; Cosmic Rays ; Statistical Thermodynamics.

ZOOLOGY

1. Adaptive modifications in Hill Stream Fishes ;
2. Disposition of the Visceral organs of fishes ;
3. Morphology of the fresh water spring Eel ;
4. Functional morphology of the Alimentary Canal of fishes ;
5. Post-embryonic development of male Copulatory apparatus of Acridid family of Grasshoppers ;
6. Comparative studies in the scales, pharyngeal, teeth, Gillrakers in Indian carps ;

7. Studies of Gonodian conditions of commercially imp. fishes.
8. Observations on the digestive system of *Coptotermes heimi* (white ants).

ANTHROPOLOGY

1. Anthropological studies of the Hill tribes Jangur Bawar (Chakrata).
2. Biological appraisal of the Bhillos.
3. Socio-Ethmic studies of the Bhangis of Delhi.
4. Ethnological studies of the organs of Chota Nagpur (Bihar).

ECONOMICS

1. Regulation of fixation of wages ; (with special reference to Indian conditions).
2. Co-operation credit in India.
3. State Regulations of Prices.
4. Prices in India (1929-49).
5. Cotton Textile Industry in India.
6. Personal distribution
7. Economic conditions in Bombay (Karnataka) 1900-50.
8. Sales Tax in India.
9. Lawless Agricultural Labourers and Agricultural Re-construction in India.
10. Development of marketing in Rajasthan.
11. Economic implications of the abolition of Zamindari.

EDUCATION

1. An investigation in the incidence of causation of recessive or withdrawing behaviours in H. S. Children.
2. Personality, deviations (particularly emotional instability) in H. S. Children, their relationship with H. S. failures, their causes and control.

HINDI

1. Origin and development of modern Hindi dramas.
2. Sufisim in Hindi Poetry.

DELHI UNIVERSITY

HISTORY

Administration of Lord North Brook.

MATHEMATICS

1. Differential Geometry of special congruences.
2. Dimensional Geometry.

PERSIAN

1. The influence of western civilisation on modern Persian Poetry.
2. Civilisation of Iran before the advent of Islam.

PHILOSOPHY

1. The concept of mind ;
2. Ramanuja's Theirm ;
3. The Philosophy of Alexandar ;
4. The problem of Value ;
5. The nature of Philosophical thinking ;
6. Psychology of Aesthetics.

URDU

Letters and letter written in Urdu from Surro to M. Azad.

GAUHATI

1. A Critical Edition of the Old Assamese Prose version of the Ramayana.
2. Forestry aspects of the Economic Geograyhy of Assam.

GUJRAT

GUJARAT COLLEGE, AHMEDABAD

GUJARATI

'Manilal Nabhubhai Dvivedi'—the celebrted prose-writer and thinker of Gujarat of the 19th Centuary.

F R E N C H

'The novels of Plerre Benoit'.

P H Y S I C S

1. Optical and electrical properties of thin metallic films.
2. Artificial clouds and optical phenomena associated with the same.
3. Scattering of light by collorids.
4. Study of Smokes.

C H E M I S T R Y

1. Synthetical anthelmintics substituterbutyro lactons.
2. Antimalarials substituted acridine derivatives Bromo and bromo methory Acridines. Iodo and Iodo methory Acridines.
3. Antileprosy drugs. Aenylalkyl acetic acids.
4. M alkyl anilines M nanyl, M n Lexyl and M nheptyl anilines.
5. Studies in Fries migratron. Investigations on the conditions with a view to study the mechanism of Fries migration.
6. Chalkones and flavones, derived from quinacetophenone.
7. Studies in Coumarnis and chromones. Attempts to synthesis natural coumarines and related compounds.
8. The Termal Decomposition of calcium nitrite and calcium hyponitrite. (completed)
9. The Thermal Decomposition of Nitrites and Hypornitrites. The action of water on hyponitrites and a study of some of the physical properties of nitrites and Hyponitrites with a view to elucidate the reactions occuring in the Decomposition of these substances.

B I O L O G Y

1. Flora of Mount Abu.
2. Flora of N. Gujarat.
3. Flora of the 'Dangs' forest.
4. Studies on the Foliar Sclereids (Preliminary survey)
5. Reports of the presence of Terminal, sub-terminal as well as diffuse sclereids in many dicots.

6. Taxonomic significance of foliar sclercids in the genus Memecylon.
7. Studies on the foliar sclercids of Dicotyledons.
 - (a) Structure and ontogeny of the Sclercids in the leaf of Diospyros discolor willd.
 - (b) Origins and development of sclercids in the leaf of Ternstroemia Japonica.
 - (c) Sclercid ontogeny in several species of the genus Memecylon.
8. Structure and origin of Sclercids in a few species of Linnæa.
9. The possible physiological role of foliar sclercids in Dictyocarpus.
10. Structure and origin of Sclercids in Mimosa hexandra.
11. The ontogeny of sclercids in several species of the Genus GLEA.
12. Ecological anatomy of Indian Epiphytes.
13. The Taxonomic significance of foliar sclercids in the Genus Loranthus.

S A N S K R I T

Research work during 1948-50

1. The Dramatic themes of Bhasa and their Treatment (Completed)
2. The problem of Sanskrit Tragedy.
3. 'Prahasanas'.
4. The Rama Story as found in the Hindu, Jain and Buddhist Literatures.
5. Nominal Composition in the Middle Indo Aryan.

VITHALBHAI PATEL MAHAVIDYALAYA

VALLABH VIDYANAGAR (ANAND)

1. Oxidation of starches, obtained from the cereals, pulses and tubers and roots produced in Gujarat by Sodium hypochlorite in the presence and the absence of Catalysts. The catalysts used are the salts of cobalt, nickel and iron.
2. To study the rate of oxidation of the different varieties of starches in the presence and the absence of Catalysts

3. To study the viscosity of different varieties of starch at different dilutions.
4. Scientific evaluation of fire-woods of Gujrat and their corresponding charcoals by studying calorific value and other analytical data.
5. Fractionation of starches of cereals, pulses, tubers and roots of Gujrat.
6. Halogenation of Mercurous salts.
7. Mercuration of the compounds containing reactive methylene group and to study the reactivity of the mercurated product by studying the rate of decomposition.

SURAT

1. History of Gujarati Journalism.
2. History of the Gujarati Novel.
3. A study of Plays attributed to Premanand.
4. Treatment of Nature in mediaeval Gujarati Poetry.

S. B. GARDA COLLEGE, NAVSARI

1. Shakespeare and Shankara.
2. The Ethics of Vaishnavism.
3. Philosophy of Aldous Huxley.
4. The concepts of Self and Salvation in Indian Darshanas.

L. D. ARTS COLLEGE AND M. G. INSTITUTE OF SCIENCE, AHMEDABAD

1. M. Alkyl phenils studies in Friedel and crafts' synthesis.
2. Studies in Antimalarials, Synthesis Acridene Derivatives.
3. Studies in Ceremarinis.
4. Studies in Fries migration and synthesis of Juro-conmarins.
5. Studies in Colloidal Systems.
6. Deshinammala Part I, published ready and Part II. Work of "Kalpssam" in press.
7. Philosophical Currents in medieval Gujarati Literature.
8. Study of cosmic rays with photographic Plate Technique.
9. Suction and Compression by Lungs.
10. Embryogeny of some plants of Boraginacal.

11. Branchiomic muscles of Fishes.
12. Cosmic ray shavers.
13. Study of Dephile moment.
14. Study of nutrition of commarins and conmarins for quinol derivatives.
15. Studies on the Embryogeny of some composition-Caesulia axillaris ; Ageratum conyzoides ; Tridax proxumbens. The work is pending publication in the Botanical Journal.
16. Sanskrit Avidya and the corresponding concept in vaidic, Buddhist and Jaina Darshanas.

B. J. MEDICAL COLLEGE, AHMEDABAD

1. Human biometric data for weights of different organs and their relations to body weights were compiled in the laboratory of this College and published jointly with the Department of Pathology, Grant Medical College, Bombay.
2. Observation on sera for comparison of standard Kahn's test with Priles precipitation test for Syphilis were undertaken in the laboratory of this College in collaboration with the Bacteriologist, Irwin Hospital, New Delhi. The results are being published.
3. Tuberculostatic drug. 4 : 4 biazosalicylic acid was tested in the laboratory of this College in collaboration with the Department of Pharmacology of this College. The results are being published.
4. Investigations regarding the toxic effects of large doses of Thiamin Chloride.
5. Experimental studies on the comparative value on analeptics.

MADRAS

ANTHROPOLOGY DEPARTMENT

1. South Indian Social Anthropology and
2. Culture historic (Social Anthropological) connection between matrilineal groups in South India & Assam. Two research trips to the Khasi Hills in Assam have been carried out in this connection and with the financial support given by the *Viking Fund* (Inc.), New-York 21.
3. The writing up and theoretical synthesis of these field-researches is now being pursued.

DEPARTMENT OF ARABIC, PERSIAN & URDU

A R A B I C

Work Completed.

1. Revised the list of Arabic and Persian words in Tamil Language.
2. Wrote an Introduction in Tamil for the work *Seydakkadi Varalaru*.
3. Prepared a press copy of the Arabic work *Maqamat-i-Baqir Agah*.
4. Wrote a work on *Islamic State and Non-Muslims*.

Work in Progress.

1. Engaged in translating *Keralapazhama* a work in Malayalam with the help of Dr. C. Achyuta Menon, Reader in Malayalam.

Note : The work *Keralapazhama* will form a companion volume to the English translation of the Arabic work *Tuhfatul-Mujahiddin* published by the Department of Islamic Studies in 1942.

2. Engaged in preparing a press copy of *Qasaid of Baqir Agah* (Arabic).

P E R S I A N

Work Completed.

1. Prepared a press copy of *Tarikh-i-Shah Jahan* by Shaykh Farid Bhakkari.

Work in Progress.

1. *Waqai-i-Saltanat-i Muhammad Shah Padshah* : Text and index completed; Introduction and glossary to be written.
2. Engaged in preparing a press copy of *Shigarf-Nama-i Wilayat* by Itisamuddin.

U R D U

Work Completed.

1. Wrote a paper on the life and works of Mawlana Baqir Agah.

Work in Progress.

1. Engaged in preparing a press copy of *Kitab-al-Rasail* of Mawlana Baqir Agah.

BOTANY DEPARTMENT

1. Soil conditions and root diseases-With special reference to *Fusarium udum* on Red Gram.
2. Studies on Indian Vegetables.
3. Study on Cotton seeds : i. With special reference to loss of seed viability due to fungal action.
ii. Action of fungicides on longevity of cotton seeds.
4. Studies in the genus *Sorghum*.
5. Micro-ecology of soils of cultivated fields of South India with special reference to the occurrence and physiology of Fusaria.
6. Antagonism between soil fungi and other micro-organisms in the soil with special reference to *Fusarium* species (*F. vasinfectum*).
7. Soil conditions and wilt diseases in plants with special reference to colonization and survival of soil Fusaria in soils treated with micro-elements.
8. Trace-element nutrition of fungi with special reference to soil *Fusarium* spp.
9. Contributions to our knowledge of South Indian Algae." (Submitted for Ph D. in August, 1950).
10. Soil conditions and wilt diseases of plants with special reference to *Rhizoctonia bataticola*.
11. Soil conditions and wilt diseases in plants with special reference to *Rhizoctonia* spp. on Cotton.
12. Studies on Fusaria in South Indian soils.
13. Soil conditions and wilt-diseases with special reference to *Fusarium* spp. on Tomato.
14. Soil conditions and Wilt of Plants with special reference to Trace Element Nutrition.
15. The saprophytic activity of Fusaria in Wilt-sick soils.
16. Studies on the Black Rot of Coffee.
17. Soil conditions and the wilt of Cotton with special reference to Host Physiology.
18. Studies on Fusaria in South Indian Soils.
19. The Taxonomy and Physiology of the genus *Fusarium* from Indian Soils.

BIOCHEMISTRY DEPARTMENT

1. Biotin replacement activity of fatty acids.
2. Enzymic role of inositol.

3. Breakdown of Adenosine Triphosphate with enzymes from the liver.
4. Isolation and activity of phospho-protein phosphates.
5. Biosynthesis of Vitamin 6.
6. Inter-relationship between tryptophane and nicotinic acid in germinated cereals and pulses.
7. Analysis of proteins (a) Estimation of hydroxy-amino-acids, (b) Estimation of tryptophane and (c) Isolation and analysis of methionine.
8. Determination of vitamin B₁₂ content of shark liver residues.
9. The iodination of peptones : Isolation and characterization of thyroxine peptides.
10. Vaccenic acid and its relation to the alleged grass-juice factor.
11. Production of gluconic acid from cane sugar and citric acid from fructose residues using *Aspergillus niger*.
12. Tryptophane metabolism in Pyridoxine deficient rice moth larvae (*Corcyra cephalonica* St.).

TECHNOLOGY DEPARTMENT

CHEMICAL ENGINEERING

Papers published.

1. Method of Designing packed columns'—Industrial Engineering. Chem. Jan : 1948, P. 93.
2. Method of subdividing logarithmic and other non-uniform scales'—Chemical Engineering. June 1948. 128.
3. Kinetics of absorption in Chemically reacting solvent systems. Trans—Ind. Institute of Chemical Engineers, Vol. I. December 1945.
4. Mass transfer in liquid—Liquid extraction—Chemical Engineering Progress. Vol. 46, No. 4, 195 (1950).
5. The Systems : Glycol-n-Amyl alcohol-Water and Glycol-n-Hexylalcohol-Water' Ind. Eng. Chem. 40, 494 (1948).
6. The purification of commercial stearic acid' Journal of the Scientific and Industrial Research (India) V. 9B. No. 2. 46 (1950).
7. A comprehensive report on Detergency and synthetic detergents. Madras University Journal. Vol. xix, (1950).
8. Long chain aliphatic nitriles from Methylesters of fatty acids J. S. I. R. (India). Vol. 9. B. No. 8-208 (1950).
9. Dehydrated Castor Oil. Indian Soap Journal Vol. XVI. No. 2. 51 (1950).

Paper under publication.

Design and construction of Rotary kilns. Trans. Ind. Institute of Chemical Engineers.

Research work completed.

The performance of absorption columns for carbon-dioxide.

Research work under progress.

1. Sesamin and Sesamolin from Sesame oil and studies in Liquid—Liquid extraction.
2. Absorption in systems involving chemical reactions.
3. Sedimentation analysis in centrifugal fields.
4. Studies in vapour-liquid equilibria of some ternary systems.
5. Fluidization of granular beds.
6. Synthetic products from Vegetable Oils and fats.
7. Plastics from Vegetable oils.

ECONOMICS

1. Budgetary Scope of Planning in Madras.
2. Economic Potentialities of S. India.
3. Pattern of the Indian Tax Structure.
4. Return on Capital and Profit Sharing.
5. Economic Recovery.
6. Finance of the Government of India since 1937 (Booklet in Press).
7. Provincial Development and the Financial Provisions of the Draft Constitution.
8. Budgeting for Full Employment.
9. Madras Agriculture. (Book in the Press)
10. Finance of Indian Planning (Book).
11. Some practical suggestions for the formation of Co-operative Farms.
12. Fighting Inflation.
13. Planning in War and Peace.
14. Sales Tax in Madras.
15. Public Enterprise in a Mixed Economy.
16. Restoration of Economic Stability.
17. The Karnataka Province. An Economic Assessment (in the press)

18. The concept of Economic Complementarity (in the Press)
19. The Perils of Our Economy.
20. The Havana Charter.
21. India and the International Monetary Fund.
22. The Reserve Bank of India.
23. India's Commodity Balance of Trade since the war.
24. Taxation of Agricultural Incomes in India with special reference to Madras.
25. Recent Trends in India's Foreign Trade.
26. Inflation and Monetary Policy with special reference to India.
27. Agriculture in the Contemplated Andhra Province and the Rest of Madras on Bifurcation.
28. Planning for Prosperity.
29. Full Employment in India (in the Press).
30. Policy relating to Agricultural Prices.
31. Mixed Economy for India.
32. Indian Fiscal Policy.
33. Public Utilities in Madras Water Supply and Electricity.
34. Indian Currency during the War.
35. Agricultural Marketing in India.
36. Public Finance in India during the war.
37. Dairy Farming in Madras.
38. State Enterprise in Madras.
39. Finance of the Madras Government since 1919.
40. Taxation of Income in India with special reference to Madras.
41. Joint Stock Banking in India.
42. Industrial Finance in India.
43. Social Security in India.
44. Agricultural Economy of Malabar.
45. Population and Agricultural Production in Madras since 1931.
46. Housing of Industrial Labour in Madras City.
47. Textile Industry in Madras.
48. Sales Tax in Madras.
49. Keynes on the Trade Cycle.
50. Indirect Taxation in India.
51. Operation of the Reserve Bank of India.

52. Profit-sharing in Industry with special reference to India.
53. Trend of Agricultural Prices in India since 1931.
54. Recent Trends in Federal Finance.
55. Industrial Development of Madras Province.
56. Inflation in Indian Economy.
57. Rural Debt and Rural Finance in the Madras Province.

INDIAN HISTORY

1. English translation of the Tirukkural (Published)
2. Purana Index (Index to the Vayu, Matsya, Brahmanda, Vishnu and Bhagavata Puranas)—Being published.
3. Gupta Polity.
4. South Indian Polity through the ages.
5. History of Christianity in South India.

DEPARTMENT OF INDIAN MUSIC

1. Musical laws, facts and phenomena known to the Indian musicologists of ancient and medieval times.
2. Murchhanakaraka melas.
3. Mela Prastara : further possibilities.
4. Mudras in Musical compositions.
5. Great composers.
6. The Pans (musical modes) of the Tevaram.
7. Seats of music in the past in India.
8. The *Grama murchhana Pradarsini*, a musical instrument which helps one to visually and aurally understand the system of gramas and murchhanas of ancient music was devised. The Dhruva-vina-Chala vina experiment, described by Bharata can also be performed and illustrated on this instrument.

INDIAN PHILOSOPHY

1. Post-Sankara Advaita, with special reference to Survesvara
2. Saiva-siddhanta as expounded in the Sivajnana-siddhiyar and its six commentaries (Research work on this subject was completed).

LEATHER TECHNOLOGY

1. A scientific study of the methods of South Indian tannage, as at present followed, was made in order to suggest improvements in the processes.

2. The present method of leaching the bark was studied and other methods were tried. It was found that greater economy could be obtained without deterioration of the quality of the liquor.
3. The present method of actual tanning was studied by analysing the liquors before and after the hides were put in and also analysing the leathers themselves. Interesting results have been obtained and experiments are being conducted on a larger scale.
4. A more detailed study of the several of the vegetable tanning liquors used for the South Indian tannage was made especially with reference to Acid Salt ratio of the liquors. This has to be continued.
5. The chemical composition of some of the South Indian Tanning materials—Avaram, myrob and Divi Divi—is under study. The constituents—resins, oils, tannins and non-tannins in methyl alcohol and water, sugar—both reducing and non-reducing—lignin and cellulose etc., are being studied.

DEPARTMENT OF KANNADA

Publications :

1. Kannada Samskriti.
2. Sangita Ratnakara (with a critical survey of fine arts in Kannada).

Works awaiting publication :

1. Desi Element in Kannada.
2. Revised Mangaraju Nighantu and wrote out a critical introduction.
3. Rukmangada Champu (Chikupadhyaya)
4. Scrutinised and summarised Kannada Manuscripts belonging to Mackenzie Collection.
5. Yakshagana Prabhandha.
6. Krishnavathara Katha Sangraha (Chikupadhyaya).
7. Comparative Vocabulary of Dravidian Cognates.

DEPARTMENT OF MALAYALAM

1. The Nayars and their Institutions.
2. Snake Cult.
3. Beginning of Early Malayalam.
4. Folk Arts and Literature of Kerala (Folk dance and drama only).

5. History and development of humour in Malayalam Literature.

MATHEMATICS DEPARTMENT

1. Duality of Linear Tensors in Affine Space Jour. Ind. Math. Soc. Vol. XII, 1948).
2. Skew Tensors and Region-Complexes (Jour. Ind. Math. Soc. Vol. XIII, 1949).
3. Minimal-Bicompact Spaces (Jour. Ind. Math. Soc. Vol. XII, 1948).
4. Ideals of the Distributive Lattice (Ibid).
5. Prime Ideals in a Distributive Lattice (Ibid, Vol. XIII, 1949).
6. Chinese Remainder Theorem for the Distributive Lattice.
7. The Foundations of Projective Geometry.
8. Topological and Order Properties of Chains.
9. An Introduction to Higher Arithmetic.
10. Banach Spaces.

POLITICS AND PUBLIC ADMINISTRATION

- I. *List of subjects in which research work was completed :—*
 1. The Administration of District Boards in the Madras Presidency, 1885-1945.
 2. City Improvement Trusts in India.
 3. Judicial Administration in Madras
 4. Pluralist Pattern in Indian Political Traditions.
 5. The Evolution of Government in Modern India (work upto 1900 completed).
 6. The Ethical basis of Hindu Political Ideas down to Kautilya.
- II. *List of subjects in which research work was being carried on :—*
 1. A History of the Madras Secretariat.
 2. Revenue Administration in the Madras Presidency.
 3. The Rise of the Indian Civil Service.
 4. The Growth of Public Administration in British India.
 5. Organization and Methods programmes in foreign Governments.
 6. Political Ideas reflected in constitutional law cases in India.
 7. Mediaeval Hindu Political Ideas.

DEPARTMENT OF PSYCHOLOGY

1. Projective Studies on Personality.
2. Language Development of Children between the ages 5 and 12.
3. A study of the scientific interests of Middle School children.
4. An enquiry into the relative popularity of various school subjects in local High Schools.
5. Measurements in Basic Education.
6. A Study of relationship between attitude and achievement in school arithmetic.
7. An investigation of the use of libraries in High School pupils.
8. A diagnostic study of the teaching of Fractions with suggestions for remedial teaching.
9. An enquiry into the practicability of introducing individual work in the class room teaching in primary schools.
10. Some Problems and Projects in Basic education.
11. A study of errors in Telugu compositions in High School pupils.
12. A study of the Organisation of Physical Education in Madras City Schools.
13. A study of vocational interests of High School students.
14. A study of the pupil records kept in schools of the Madras Province with suggestions for improvement.
15. A critical examination of the new secondary school curriculum with special reference to the needs of Adolescence.
16. A study of some individual differences among boys and girls aged 8 and 9 in Madras City Schools.
17. A study of the problems of order and discipline in some schools in Madras City.
18. An investigation of Audio-Visual education in Madras City Schools with suggestions for its development.
19. A critical study of the Development of School curricula in the Madras Presidency.
20. Factors affecting Recall: An investigation of their comparative significance for the class room procedure.
21. A critical and constructive study of some experiments in Self Government in Madras Schools.
22. A Comparative study of certain character traits in children of Basic Schools and other schools.
23. A diagnostic study of the errors of pupils in written examinations.

24. A critical study of Tamil Text Books in General Science based on the revised syllabus for High Schools in Madras.
25. A diagnostic study of 500 S.S.L.C. Answer papers in Geography, 1947.
26. A Critical Analysis of the Text Books in Elementary Mathematics in the secondary schools of the city of Madras.
27. A study of the Extra-curricular activities as observed in some High Schools at Madras.
28. Use of Maps and Charts in history teaching in the Secondary stage.
29. A critical study of the compulsory education in Madras City with suggestions for its extension and improvement.
30. A diagnostic study of 500 S. S. L. C. answer papers in English IInd Paper of 1947.
31. A diagnostic study of 400 S. S. L. C. answer Papers in Elementary Science, IInd Paper—Natural Science.
32. A diagnostic study of 500 S. S. L. C. Answer papers in Elementary Mathematics.
33. A survey of Libraries for school children up to the middle school stage with constructive suggestions.
34. A study of the common errors in Tamil in Form I with a view to discovering sources of error and suggesting remedial measures.

SANSKRIT DEPARTMENT

1. Aspects of Education in Ancient India.
2. Vol. I (A) of the New Catalogus Catalogorum of Sanskrit and Allied Works and Authors. Vol. II is being compiled.
3. Critical edition with Introduction, English summary etc. of the historical poem connected with 18th century South Indian History called Anandarangavijaya Champu.
4. The Sringaramanjari of Saint Akbar Shah on the subject of Nayaka-Nayikas in Alankara Sastra—critical edition with an elaborate account of the history of the subject and the literature thereon.
5. The Amaramandana of Krishna Suri, a tract in defence of the principles on which the famous lexicon Amarakosa has been compiled, against the criticisms of Sri Harsha.
6. *Papers :—*
 - (i) Dara Shikoh's Majma-ul-Bahrin (an edition of its Sanskrit version—Samudra Samgama grantha is being prepared).
 - (ii) The date of the Yogavasistha (post-Sankara).

- (iii) The Gurunathaparamarsa (relating to Abhinavagupta and his works.
 - (iv) The Allahabad Pillar inscription, verses 3 and 8 (a revised interpretation and translation).
 - (v) Kalidasa and Kautilya.
 - (vi) Some Kavi-Rakashasas, their identities and works.
 - (vii) A New work of Abhinavagupta—Paryanta-Panchasika
 - (viii) The Natakalakshana Ratna kosa of Sagara-Nandin.
 - (ix) Forms of Popular Religious Education in South India.
 - (x) One Act Drama in Sanskrit.
 - (xi) The Tamil Natya Ms Suddhanandaprakasa.
 - (xii) A Sculpture Motif and its probable philosophical significance.
 - (xiii) A piece of Amaravati sculpture with a Prakrit inscription.
 - (xiv) Indian Classical Imagery.
 - (xv) Authors and works quoted in the Syadvadaratnakara of Srideva.
 - (xvi) Poet Divakara and his works.
 - (xvii) The Hanumadvimsati of Kumara Tatacharya (Text edited from inscription).
7. Nyaya Siddhanta tattvamrta of Srinivasa, edition of a Nyaya text.
 8. The Manishapanchaka with the new commentary of Sadasiva Brahmendra—Sanskrit text edited.
 9. The Advaitasrutibhedanirasa—Sanskrit text edited.
 10. The Nyayaratnadipavali (Advaita)—Sanskrit text edited.
 11. The Padarthatatvanirnaya (Advaita) Sanskrit text edited.
 12. Bhattadipikaprabhavalī.

STATISTICS DEPARTMENT

1. Banking and Currency Statistics in India.
2. Application of Maximum Likelihood to Factor Analysis.
3. Statistical Study of Half a Century of the Co-operative Movement in India.
4. Factor Analysis and its Application.
5. Time Series Analysis—A Statistical Study of the Import Trade of India, 1900-1938.
6. Estimation and Testing of Hypotheses.

DEPARTMENT OF TELUGU

LINGUISTICS

1. Dravidian roots and their development.
2. Desi—in South Indian language & literature.
3. History of Philology with special reference to Telugu Grammar.

LITERATURE:

1. Lives of Telugu Poets from earliest times to 1250 A.D.
2. Udaharana literature in Telugu.
3. Dwipada Kavya literature in Telugu.
4. Veera Saiva literature in Telugu.
5. Nannaya's age in Telugu literature.
6. Telugu Literature under Pudukkota Rulers
7. Critical notes on 25 standard works in Telugu.
8. Chronology of Telugu Poets—inscriptional evidences.

DEPARTMENT OF TAMIL

1. The contribution of European scholars to Tamil Language and Literature.
2. Words and their significance (in English)—A study in Tamil Linguistics (Going through the Press).
3. Comparative vocabulary of Dravidian cognates.
4. The Religion and philosophy of the Thevaram (Devotional Saiva Literature).
5. Elucidation of the Idu (commentaries on Nalayira Prabhandam. The first part has been sent for publication.)

ZOOLOGY DEPARTMENT

1. Copepods parasitic on Indian Fishes.
2. Parasitic and free-living Isopods of Madras.
3. Studies on Pelagic and Sand dwelling copepods of the Madras Coast.
4. Biology of the Edible crab.
5. Studies on Acanthocephala and studies on Mongenitic Trematodes.
6. Lagoon deposits of Krusadi area with special reference to Foraminifera.
7. Food of some fishes.
8. Anatomy of *Ptychodera flava*.

9. Studies on Nephridea of Polychaetes.
10. Fat contents of some fishes.
11. Amphipods of Madras.
12. Studies on Gastropods.
13. The digestive system of fishes.
14. Cirripedia of Madras.
15. Biology of *Penacus Indicus*.
16. Embryology of brackish water crab & of a parasitic Isopod.
17. Biology of Brackish water bivalves.
18. Trematodes of Madras.
19. Embryology of *Ophiocephalus*.
20. Helminths of Fishes.
21. Studies on Pelagic copepods of Madras Coast.
22. Biology of the edible crab.
23. Food of some fishes of Madras.
24. Foraminifera of Krusadi.
25. Studies on the Acanthocephada.

Papers Published :

1. Sex differences in *chalmus adult caligus policanthi* n. sp.
Records of Indian Museum Calcutta.
2. *Artacolax Unicirrus*—an ergasilid parasite—not published—
sent to Indian Academy.
3. Notes on morphology of *Propallene Kempfi*—Linnaean
society, London.
4. *Parapetalus candatus*, parasitic on Rainbow Saidine—
Indian Academy.
5. Two *dichelesthid* copepods from S. India—Parasitology
Molteno Inst. Cambridge.
6. *Synestius Caliginus* as parasite of the grey pomfret—Records
of Indian Museum.
7. *Brachiella Trichiurus* n. sp. from the ribbon Fish—*Spolia*
Zeylanica, Colombo.
8. *Thysanote appendiculata* from *Stromatens niger*—Records
of Indian Museum, Calcutta.
9. *Perissopus Manuelensis* n. sp.—*Spolia Zeylanica* Colombo.
10. *Lernanthropus Sciaena*—Records of Indian Museum XLV,
Part III.

11. Anatomy and Physiology of *caligus savala*—proceedings Zoological Society London.
12. Sex differences in Indian Parasitic copepods—Madras University Journal.
13. *Lernthropus Dussumiceis* n. sp.—Parasitology, Molteno Inst. Cambridge.
14. A new Ergasilid *Bonolochus*—Multispinesa—Records of Indian Museum, Calcutta, XLV Part III.
15. Two male parasitic copepods from Madras—Ann. Mag. Nat. Hist. London, ser. 12, vol. II, p. 359—1949.
16. Three copepods parasitic on *T. Haumela*—Journal of Parasitology N. Y.
17. *Lernaea chackoensis*—Parasitology, Cambridge.
18. Notes on life history of *L. Chackoensis*—Parasitology, Cambridge.
19. *Peniculus Trichiuvii* parasitic on the ribbon fish—Ann. Mag. Nat. Hist. London.
20. *Lernaeopoda stromati*—Proceedings, Indian Academy.
21. *Clavillisa Dussumieria* n. sp. from a Madras fish—Proc. Zoo. Soc. London.
22. *Bonolochus acuta* n. sp. from a sardine—Proc. Indian Academy of Science Vol. XXVII., No. 1.
23. *Ctenioplana Bengalensis* of free living copepods—Proc. Indian Academy of Science, Bangalore.
24. Isopod parasites of free living copepods—Proc. Indian Academy of Science XXVII No. 5.
25. Developmental stages of a Harpacticid—Current Science, Bangalore.
26. Mediary eye of copepods—Current science, Bangalore.
27. Sexdimorphism in pelagic copepodes—Indian Science Congress.
28. Breeding seasons of the copepods of Madras Coast—Indian Science Congress.
29. Stages in the development of *Macrosetella gracilis*.
30. Larval stages of the copepodes in the Madras plauleton and their seasonal fluctuation—Jour. Madras Univ.
31. Early stages in the development of *Sacculina*—Proc. Ind. Academy of Science, Vol 30, 1949.
32. Encrusting Foraminifera—Madras University Journal.

33. Stages in the development of *Tornaria* Krohn (Indian Science Congress).
 34. Notes on life history of *Moniliformis* (Current Science Bangalore).
 35. Fat deposition in the rainbow sardine (Madras University Journal).
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MYSORE

BASAPPA INTERMEDIATE COLLEGE, BANGALORE CITY

1. A critical study of "Karnaparya's Neminathapurana".
2. A study of Kannada Prosody.

CENTRAL COLLEGE, BANGALORE

DEPARTMENT OF ZOOLOGY

PALAEONTOLOGY

1. A study of Micro-foraminifers from the Trichinopoly cretaceous rocks.
2. A study of fossil woods from the Trichinopoly cretaceous rocks.

MINERALOGY:

1. A study of Physical, Chemical and Optical properties of pyroxenes and amphiboles from Mysore.
2. A study of Physical, Chemical and Optical properties of chlorites from Mysore.

DEPARTMENT OF CHEMISTRY

1. Deodourization of alcohol from the distillery at Mandya.
2. Indian 'Alsas'.
3. Fertility of Mysore Soils.
4. Amphoteric nature of Metallic hydroxide.
5. Studies of the influence of 'ageing' under an ozoniser discharge of Joshi effect in high pressure chlorine in *Journal of Indian Chemical Society* Vol. XXV, No. 5, 1948.
6. Physico-chemical properties of Vermiculite.

7. Analysis of the Mysore race chrysalis oil and the determination of its glyceride composition.
8. Study of the molecular compounds of 1:2:4 tri-chloro 3:5 dinitro-benzene.

DEPARTMENT OF PHYSICS

1. Interaction of atomic energy states.
2. Magnetic properties of germanium.
3. Magnetic properties of synthetic and natural ruby and sapphire.

DEPARTMENT OF ZOOLOGY

1. Cytology and Cytochemistry of Protozoa.
2. Cytology of Insects and Arachinds.
3. Osteology of Fishes.
4. Reproductive Cycle of Rodents.

FIRST GRADE COLLEGE, MYSORE

DEPARTMENT OF BOTANY

Work Completed :—

1. Endosperm in *Cassia Tora* Lim.
2. Integumentary Vascular tissue in *Cassia Tora*.
3. Endosperm in *Rothia trifoliata* pers.
4. Suspensor Haustoria in some species of *crotalaria*.
5. Development of embryo in *Trigonella Foenum Graecum*.
6. Nutritional Mechanism of the developing seed in *Vigna Cayang* Endl.
7. Development of embryo in *Aeschynomene indica* lim.
8. Endosperm in some species of *Cassia* lim.

Work in Progress :—

Seed development in severa! members of the *Leguminisae*.

DEPARTMENT OF ENGLISH

1. Bacon's Position in Science and Philosophy.
2. Thomas Carlyle.
3. An Introduction to Bacon's 'New Atlantis'.
4. T.S. Eliot and English Poetic Drama.

5. The Art of the Novel (In Kannada).
6. A Study of Poetics.

DEPARTMENT OF GEOLOGY

1. Trachybasalts from the Cuddupah traps.
2. Algal Structure from the Cuddupah limestones.

DEPARTMENT OF HISTORY

1. History of Mysore from 1700-1800.
2. Haider Ali and the Beginnings of Indian Nationalism.

DEPARTMENT OF ZOOLOGY

1. The Chondrocranium of Mabuya with an account of the adult osteocranium.
2. The development of the Chondrocranium of *Hippocampus gutturalatus* (in progress).
3. Skeletal system of Mabuya and Lygosoma (Comp. study).

DEPARTMENT OF SANSKRIT

1. Nature and Scope of Vrthies in Sanskrit poetics.

DEPARTMENT OF KANNADA

1. Kannada Drama.
2. Textual criticism in Kannada.

DEPARTMENT OF MATHEMATICS

Modern Algebra in Particular Lie Groups and Lie Algebras and application of the Theory of groups and Modern algebra to the theory of Elementary particles in Physics.

INTERMEDIATE COLLEGE, BANGALORE

DEPARTMENT OF ZOOLOGY

The Development of Chondrocranium in Ophicephalus with an account of Osteocranium of the adult.

DEPARTMENT OF GEOLOGY

A comparative account of the heavy mineral suites from some granites of Mysore. (The result of 22 granitic rocks

was completed and a note published in the Geologists Association, Mysore Geological department in September 1950).

COLLEGE OF COMMERCE, BANGALORE

Food Crisis and Economics of Irrigation.

INTERMEDIATE COLLEGE, CHIKMAGALUR

The Foreign Policy of Tipu Sultan.

INTERMEDIATE COLLEGE, KOLAR

1. Studies in Kannada Prosody (in Kannada).
2. Some unrecognized stanzas of Aswaghosha (in English).

INTERMEDIATE COLLEGE, HASSAN

1. Types of personality according to Indian thought.
2. The resolution of the Clifford Algebra with any number of symbols as the direct sum of minimal left ideals.

MAHARAJA'S COLLEGE, MYSORE

DEPARTMENT OF KANNADA

1. Sri Ramayana Dashanam Vol. I and II. (*Kavyalaya, Mysore*).
 - (i) Vachanakara Basaveshwara.
 - (ii) Kaviyalli Vibhuti.
 - (iii) Sakti Kavi Ranna.

DEPARTMENT OF SANSKRIT

1. Rg. Vedic Legends through the Ages.
2. On the name "Sunassepe". (*Poona Orientalist* Vol. XIII Nos. 1 & 2).
3. Kurma Purana with Kannada Translation.

DEPARTMENT OF URDU & PERSIAN

1. Darya-i-Latafat of Syed Inshaulla Khan Insha—His biography and certain points of grammar explained—Title of publication is Tahqiqi Nawadir.
2. The Dreams of Tippu written by himself—edition, and translation with introduction and explanatory notes in Urdu & English.

3. Biographical Literature in Urdu.
4. Urdu language and Literature in Mysore.
5. Mir Hayath, the author of Misbahul-Hayath—his life and works.
6. Influence of Persian Poetry on Urdu Poetry with special reference to the period of Zauq and Ghalib.

DEPARTMENT OF PHILOSOPHY

1. Chapter on "Dwaita" in the "History of Philosophy."
(Published by Government of India, Ministry of Education).
2. "Madhava" (Academy of Tamil, Madras University).
3. "Dvaita." (Academy of Tamil, Madras University).
4. The fundamental value of Society. (Aryan Path, February 1950)
5. A Hindu Orientation to the Philosophy of Society.
6. Scepticism in Eastern & Western Philosophy.
7. Individuality & Value in the Philosophy of Sree Ramanujacharya.
8. The Sociology of Public Opinion.
9. The Brahma Autra Bhashya of Sri Madhwacharya.
10. Bharatiya Dharmada rahasya mathu mahatva).

DEPARTMENT OF HISTORY

1. Evolution of the Yajnopavita (Q. J. Mythic Society).
2. Vedas and the Atman. (Q. J. Mythic Society).
3. Career of Abdul Rahim. (University Journal, March 1950).
4. History of Rome.
5. Political Philosophies of the East and the West. (Karmaveera-Dharwar. Depavali Special issue).
6. Administration experiments of the British India. (University Journal 1949).

DEPARTMENT OF ECONOMICS

1. The Road to Industrial peace. (The Indian Journal of Economics 1949).

DEPARTMENT OF POLITICS

1. India and the Commonwealth.

2. "Reflections." (Deccan Publications, Bangalore).
3. Sarvodaya movement in South India. (Deccan Herald-Dasara Special 1949).

DEPARTMENT OF PSYCHOLOGY

1. Experimental study of Values.
2. Job-analysis.
3. Preparing a dictionary of Psychological terms in Kannada.
4. Determination of standards of performance intelligence tests among persons of several castes & religions.
5. Measurement of mental energy.
6. Extrasensary perception.
7. The relation between verbal and non-verbal tests of intelligence.
8. Distribution of intelligence among children from 4 to 8 years of age.
9. Masanlimts and Fennininits test.
10. Psycho-galvano reflex as an index of minor defects of character.
11. Motivation in learning.
12. Group tensions.
13. Thematic Apperception test.
14. The effect of language on the hierarchy of Values.

DEPARTMENT OF GEOGRAPHY

1. Agriculture in Mysore.

DEPARTMENT OF MATHEMATICAL ECONOMICS & STATISTICS

1. Social Survey of Hulikere. (For the UNESCO Seminar 1949).
2. Rural Libraries in Mysore. (Adult Education in Mysore, 1949).
3. Examples of non-connectional algebras (*Mysore University Journal* Sept. 49).
4. A Universal Income Constant.
5. Devaluation and Inflation.
6. Mathematics in the Service of Humanity.
7. Recent Statistical Developments in Economics.

8. Numerous original questions which have appeared in the question papers of the University.
9. Calculation of moments by successive Indian summation. (Indian Statistical Institute, Calcutta 1948-49).
10. Methods of deducing the normal and the poisson Distributions as Approximations of the point Binomial. (36th Ind. Sc. Congress).
11. Calcutta Economic Enquiry (Preliminary Survey, 1949) Analysis of Data. (In collaboration 1949).
12. A novel method of deducing Stirling's Formula-1950.
13. Double sampling methods in Forecasting jute yield. (Indian Statistical Institute, Calcutta 1949-50).
14. A comment on spurious correlation (37th Ind. Sc. Congress 1950).
15. Use of Differences in the Valuation of Sampling variances. (37th Ind. Sc. Congress 1950).
16. The Money-Leisure problem or the Equilibrium between Income and Leisure. (Ind. Inst. Research Seminar 1949-50).
17. Regression and Ratio Methods in Sample surveys. (Ind. Stat. Institute 1950).

DEPARTMENT OF MATHEMATICS

1. On an inequality concerning orthogonal polynomials (*Proc. Ind. Acad. Sc.*, A, 29, 1949; 391).
2. On an inequality relating to Legendre polynomials (*Mys. Univ. Journal*, Aug. 50).
3. Analogue of Blasius' formula in subsonic compressible flow (*Proc. Nat. Inst. Sc.*, 14, No. 8, 1948, 339).
4. Compressible shear flow—I (*Proc. Nat. Inst. Sc.*, Vol. 15, No. 5, 1949, 219).
5. Compressible shear flow II (*Proc. Nat. Inst. Sc.*, *ibid* P. 233).

MAHARANI'S COLLEGE FOR WOMEN, MYSORE

1. Social problems in the Mahabharatha.
2. Scepticism in the East and the West with special reference to Nagarajuna and David Hume.
3. Tagore as a Lyric Poet.

NAGPUR**DEPARTMENT OF BIOCHEMISTRY**

1. Species difference in the Biosynthesis of vitamin C and response to diabetogenic substances. (*Nature*, 162, 660, 1948).
2. Role of intermediary fat metabolites in changing the blood sugar and in accelerating glycogenolysis both in vivo and vitro. (*Science & Culture*, 14, 211, 1948).
3. Colour reactions of sterols. Part I—Action of the Rosenheim reagent on cholesterol. (*The Journal & Proceedings of the Institution of Chemists*, XX, 139, 1948).
4. Studies on the aetiological factors responsible for the onset of diabetic symptoms. Part I—Effect of prolonged injection of intermediary fat metabolites on the blood sugar level in normal animals. (*Ind. Jour. Med. Res.*, 37, 61-70, 1949).
5. Studies on the aetiological factors responsible for the onset of diabetic symptoms. Part I—Effect of long continued administration of some fat metabolism products on the potency of pancreatic insulin of guinea-pigs. (*Ind. Jour. Med. Res.*, 37, 71-75-1949).
6. More about the concept of diabetes. (*Medical Digest*, 17, 161, 1949).
7. Investigation on the new anti-diabetic principle (amellin) occurring in nature. Part VIII—Its role in the direct metabolism of fat in the experimental animals (albino rats). (*Ann. Biochem. Expt. Med.*, IX, 11-16, 1949).
8. Glycogen storage and lactic acid oxidation as affected by different high carbohydrate diets with and without amellin. (*Ann. Biochem. Expt. Med.*, IX, 31-40, 1949).
9. Studies on the antibacterial effect and toxicity of amellin. (*Ind. Jour. Physiol. & All. Sc.*, 4, 69, 1950).
10. Role of vitamin C on ketolysis in vitro. (*Science & Culture*, 16, 34, 1950).
11. Pancreatic Changes after Injection of Intermediary Fat Metabolites. (*Science*, 112, 92, 1950).

12. Disturbance in the balance of hepatic glycogenesis-glycogenolysis by intermediary fat metabolites and its restoration.
13. Studies on Experimental Diabetes. Part I—Progressive Decrease of glucose-tolerance and glycogenstorage by acetoacetate and its prevention by insulin & amellin.
14. Studies on Experimental Diabetes. Part II—Changes in blood lactic-acid and ascorbic-acid by acetoacetate and the additional effect of insulin and amellin.

DEPARTMENT OF POLITICAL SCIENCE

1. The Role of the State in the Organisation of the Socio-economic life of India during 1818-1935.
2. Social and Political Ideas of Lokamanya Tilak.
3. Social, Political and Economic Ideas of M.C. Ranade.
4. Nationalism and Communalism in Indian Politics.
5. Indian Democracy and the Organisation of Political parties.
6. Political Thought in Maharashtra from 1857-1948.
7. The condition of Indians abroad.

LAXMINARAYAN INSTITUTE OF TECHNOLOGY, NAGPUR

Papers published during 1948-49.

1. Examination of some coking coals of C P. Part III, Low temperature carbonisation assays (*Q. J. G. M. S. (India)* Vol. XX, No. 2, pp 37-44.)
2. Activation of Bauxite for bleaching vegetable oils and fats (*Indian Patent-No. 39320, J. S. I. R., Vol. VIII, 1949, Saletore, Sutaone, Mene*).
3. Magnesium—Rapid alkalimetric determination in calcium and magnesium carbonate ores—(*Anal Chem*, 21,618, 1949.)
4. On the mechanism of viscosity of liquids—(*J. Chem Phys.*, 17,536-9, 1949.)
5. Interpretation of the parachor (*J. Amer. Chem. Soc.* 71, 1883, 1949.)
6. Revision of the parachor (*J. Amer. Chem. Soc.* 71,18 1949.)

Papers published during 1949-50 :—

1. The Evaluation of Definite integrals in Chemical Engineering calculations by Gauss's Formula, (*Transactions of Indian Institute of Chemical Engineers* Vol. I, Dec. 1949.)

2. Solvents for the extraction of Acetic acid from pyroligneous liquors (*Indian Institute of Chemical Engineers of Bombay* Read on 29-22-49).
3. Effect of alkali chlorides on the intensity of Cyanogen Bands in Carbon-arc (*Current Science*, Oct. 1949, 18,373.)
4. Estimation of Acetic acid in pyroligneous liquors (*Current Science* Aug. 949, 18,1296-97.)
5. Interpretation of the Parachor (*J. Amer. Chem. Soc.* 71, 1883 (1949).
6. Revision of the Parachor (*J. Amer. Chem. Soc.* 71,1898 (1949).
7. On the Mechanism of Viscosity of Liquids (*J. Chem. Phys.* 17, 536-9 (1949).
8. Magnesium-Rapid Alkalimetric Determination in Calcium and Magnesium Carbonate ores (*Anal. Chem.*, 21, 618 (1949).
9. A Study of some of the Factors Influencing Alkali Refining of Groundnut Oil (*Trans. Indian Institution of Chemical Engineers*, Vol. I, 1947-49 pp. 1-11.)

Accepted for publication:—

Stability of Oil Varnish Emulsions (*Jour. Scientific and Industrial Research*, New Delhi.)

Papers ready for publication or communicated:—

1. A note on the dephlegmation of Wood Distillation of Vapours.
2. Destructive Distillation of some M. P. Wood.
3. Determination of the Acid Number of Oils and Resins in Aqueous Medium (comm. to *Analytical Chemistry U.S.A.*)
4. A Note on the properties of Interfacial Films (comm. *J. Amer. Chem. Soc.*)
5. Colorimetric Determination of Total Lead in Paint Driers (comm. to *Ind. Chem. Soc.*)
6. A Note on the Opacity of Emulsions (comm. to *J.S.I.R.*)
7. On the Dependence of Average Polymer Molecular Weight on Change in the Particle diameter of a Soap stabilized monomer Emulsion.

8. Moisture determination in non-aqueous liquids by conductometric titration.

Work in progress:—

1. The system Ethyl-acetate-acetic-acid-water.
2. The system Furfural acetic acid-water.
3. Dephlegmation of wood distillation vapours.

NAGPUR MAHAVIDVALAYA

1. The Chhatisgarh Plain—A regional study of the Upper Mahanadi.
2. The contemporary Englishman's estimate of Shivaji.
3. The policy of Shivaji and the English.
4. The Hubli Factory and Shivaji.
5. The plunders of Surat by Shivaji.
6. The Karwar Factory and Shivaji.
7. The History of the reparations of the Rajapore losses.
8. Some misconceptions about the succession of monarchs in the Nizam Shahi dynasty.
9. Malik Ambâr and the Portuguese.
10. The scope of map-reading.

S. B. CITY COLLEGE

1. The Social and Political Institutions of Maharashtra (as gleaned from the writings of the Saints of Maharashtra).
2. The role of the state in social and economic welfare work in India.

CENTRAL COLLEGE FOR WOMEN

The development of women's higher education in India.

COLLEGE OF SCIENCE

1. Kinetics of the Dissolution of mercury in nitric acid.
2. Conductivities of Calcium gluconate solutions.
3. Kinetics of the reaction between chloral hydrate and Bromine.

MEDICAL COLLEGE

1. Morphologic changes in Coronary heart diseases.

2. Medical Education to-day.

COLLEGE OF AGRICULTURE

1. Factors affecting benefit of mixed cropping.
2. Wheat rusts and the roll of a plant breeder.
3. Fermentation and Enzyme action.

VIDARBHA MAHAVIDYALAYA

1. The date of the Ellora plates of Dantidurga.
2. A lead coin of Satavahana.
3. Some more coins of the Mahisha Dynasty.
4. The spread of Saka Era in South India.
5. New light on the epoch of the Kalachuri Era.
6. A note on the Tivarkhed Plates of Nanaraja.
7. Inscription in Cave XVII at Ajanta.
8. The Saiva Acharyas of the Mattamayura clan.
9. A note on the Kesaribeda plates of Arthapati.
10. A note on the Lodhia plates of Mahasivagupta Balarjuna.
11. A note on the Khairtal Hoard of the Gold coins of Mahendraditya.
12. A note on the Apratigha coins of Kumaragupta I.
13. Life and Matter as envisaged by the Seers of Modern India and the New Vitalistic and Naturalistic Schools.
14. On some new species of the genus *Centrorhynchus* Luhe, 1911.
15. On some juvenile forms of *Acanthocephala* of the Genus *Centrorhynchus* from India.
16. Rainfall in relation to agriculture and population in Yeotmal District.
17. A geographical study of rainfall in Amravati.

UNIVERSITY TRAINING COLLEGE, NAGPUR.

1. An Investigation into the Factors Influencing the Bilingual Situation in Language Learning.
2. Description of Tendencies of Examination marks of the group offering Science, Geography and Maths combination.
3. A Study of the Teacher Under Training and His Motives.

4. Two Methods for Scoring Items for Quality Differences by the Rating Method.
 5. Examination of Certain Assumptions in the Theory of Classical Indian Music.
 6. A Hand Writing Scale for Marathi.
 7. An Investigation into the Teacher's Work-Load.
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OSMANIA

AGRONOMY

1. Castor Production in Mahboobnagar District.

AGRL. BOTANY

1. Physiology of Plant Hormones.
2. The Significance of Colchicine in the crop Plants.
3. Improvement of Gaorani among the varieties of Hyderabad Cottons.

AGRL. ENTOMOLOGY

1. Diseases transmitted by Insects.
2. *Coccinellids* of the University Farm with special reference to *Chilomenes sexmaculata*.

PLANT PATHOLOGY

1. Plant Viruses.
2. *Striga* : Recent work in India.

HORTICULTURE

1. Orange and Mosambi cultivation in Hyderabad District.
2. Orange Cultivation in Osmanabad.
3. Cultivation of Grapes in Bir Dist.
4. Propagation and cultivation of grafted mangoes with special reference to Hyderabad District.

AGRL. ECONOMICS & SOCIOLOGY

1. Shehar Hyderabad men Murghion ki Kharid o Farokht (Urdu)

2. Zila-e-Mahbubnagar men Dehi Talim (Urdu)
3. Qasba-e Binola, Zila-e-Nizamabad ki maashi va zamaaji Tahqiq.

PANJAB

ZOOLOGY

1. Cytological studies, Cytology.
2. Entomostraca of Okha.
3. Nature of the yolk nucleus in spider *P. paykulli*; cytology.
4. Studies of trematodes of tortoises and fishes of the Punjab (I).
5. Nature of osmiophilic granules in the egg of leech; cytology.
6. Spermatogenesis of reptiles; cytology.
7. Systematic work on fishes of Hoshiarpur.
8. Spermateleosis in a Scolopendrid; cytology.
9. The anatomy of *Porocaecum angusticollae* (Mollin).
10. Parallelism between variations of taxonomic value and cytological resemblances in allied species, spermatogenesis of scorpions; cytology.
11. The anatomy of the scorpion, *Buthus acutecarinatus*.
12. Spermatogenesis of *Porocaecum angusticollae* (Mollin); cytology.
13. Spermatogenesis of *peneopsis affinis*; cytology.
14. Respiratory adaptations in certain Indian air-breathing fishes.
15. Chromosome behaviour during spermatogenesis of *Culex fatigans*; cytology.
16. Cyprinoid air bladders and their associated structures.
17. Morphology and anatomy of *aulocophora faviocolis*.
18. Food and feeding habits of some commercial fishes of the plains of the Punjab (I).
19. Spermatogenesis of a forest beetle, *Plocaederus obesus*; cytology.
20. Sprematogenesis of *Aulocophora faviocolis*; cytology.
21. Morphology and anatomy of Gurdaspur sugar cane borer.

22. Sytematic and cytological studies of ciliates from gut of fishes; cytology.
23. Sprematogenesis of *coccinella septumpunctata*; cytology.

D.A.V. COLLEGE JULLUNDUR CITY

HINDI & SANSKRIT DEPARTMENT,

1. A critical edition of the Inscriptions of the Imperial Guptas their feudatories and immediate successors. 320-550 A.D.
2. Critical study of the Rgvedabhasya of Swami Dayanand.
3. A critical edition of the Dhvanyaloka
4. A critical edition of Rgvedabibhasyabhumika of Swami Dayananda.
5. Sanskrit Inscriptions as sources of Indian History during the Muslim period.

BOTANY DEPARTMENT, KHALSA COLLEGE,
AMRITSAR

1. Stages in the embryology of *Cupressus sempervirens* with particular reference to the formation of multiple male cells in the male gametophyte. (*Nat. Acad. Sci, India* Vol. XV, No. I, 1949).
2. Some observations on the prothallus of *Diplaxium esculentum* (Retz.) (Sev. Jour. Ind. Bot. Soc. Feb. 1949).
3. Embryology of *Petalophyllum indicum* Kash. and a new suggestion on the evolution of a thalloid habit from foliose forms. (*Bryologist. America* 1950).
4. Effect of sulfanilamide on mitotic division in plant cells. (*Bot. Gaz America*. Vol. 110 Vol 5 Sept. 1949).
5. The inequality in size of the male nuclei in the genus *Ephedra*. (*Anns. Bot. England* 1950).
6. Occurrence of hermaphrodite flowers and development of female gametopyte in *Ephedra intermedia*. (*Ann. Bot. England* 1950).
7. Anatomy of *Stenochlaena palustris*. (*Ann. Bot. England* 1950).
8. Studies on the variability of *Sclerotinia fructicola*. (*Phytopathology* 39 : 621-636. 1949).

Research work completed.

1. Embryology of *Sewardiella tuberifera*.
2. Chromosome studies in some conifers.
3. Spore germination studies in some Indian Marchantiales.
I. Rebouliaceae
4. Cytomorphology of *Cryptomitrium himalayense* and *Athalamia pinguis*.
5. A new spore germination type in *Stephensoniella brevipedunculata*.
6. Colchicine effect and production of polyploid spermatozoids in the prothalli of *Dryopteris subpubescens* and *Goniopteris prolifera*.
7. Effect of sodium nucleate and sulfa compounds on mitosis in *Ephedra gerardiana* and *Pisum sativum*.
8. Some pharmacognostical observations on Colchicine containing plants.
9. Heterochromosomes in the Indian variety of Hemp (*Cannabis sativa var indica*).
10. A study of the cytology and the gametophytic generation in some Indian Dryopterid Ferns.
11. Cytogenetical and breeding studies in the genus *Colocynthis*.
12. Cytology of the Indian species of *Tribulus* and the occurrence of a natural tetraploid in *Tribulus terrestris*.
13. Discolouration of cotton lint by fungal parasites.
14. Preliminary studies on the nutrition of *Sclerotinia fructicola*.
15. The genus *Peronospora* in the Panjab:—A cytologic and taxonomic study.

DEPARTMENT OF PANJABI

1. New light on the Buddha's First Sermon: being a fresh translation from original Pali of the Dhamma Chakka Pavattana Sutta, and a comparative study of the Sutta with the Bhagawad Gita and the Japu of Guru Nanak Dev (1469-1538 A. D.)
2. Ramaite and Krishnaite poetry in Panjabi (Panjabi).
3. Studies in Guru Gobind Singh's (1666-1708. A.D.) translation and commentary (in verse) of the Bhagawad

Gita : his elucidations, and his departures from other commentators. (Panjabi).

4. Sikh Mysticism—a study based on a portion of the Sukhmani, the longest known medieval mystic poem in Hindavi, by Guru Arjuna Deva (1563. 1606 A.D.) (English).
5. Worship (Bhakti) and salavation (Moksha) according to the Bhagawadgita. (English).
6. The nature, role and content of Philosophy according to the Bhagwadgita (English).
7. Sail Dihlavitaur Hasrat Mohani—a study of the love lyrics of two famous modern Urdu poets of Lucknow and Delhi (Urdu).
8. Hindu Contribution to Urdu Literature (Urdu).
9. Life and Hindavi Poetry of Namdev, the Maratha Saint, based on hitherto unutilized Persian, Hindi and Panjabi manuscripts and printed works (Hindi).
10. Life and Hindavi Poetry of Marabai, based on hitherto unutilized Hindi and Panjabi manuscripts and printed works. (Hindi).
11. Further studies in the life, poetry, teachings and influence of Gorakhnath, based on manuscripts available at the Jain Bhandar, Patti (Amritsar Distt.) and on the Tales of Taranath, and also on information gathered personally from Panjab Jogis (Kan-Phattas or Kan-Pates). (English).
12. Woman in Panjabi Poetry, medieval and modern, with special reference to the tales of Nala Damyanti and Bharthri Hari (Panjabi).

GEOGRAPHY DEPARTMENT, GOVERNMENT COLLEGE, LUDHIANA

1. Cattle in the 'Haryana.'
2. Geography of the Ferozpur District.
3. Regional and Economic Geography of the Upper Ghaggar Plain.
4. Sugar Cane cultivation in the East Panjab.
5. Forest Resources of Himachal Pradesh.

6. Climate of the Panjab.
7. Water Logging in the Panjab.

ENGLISH DEPARTMENT, GOVERNMENT COLLEGE,
HOSHIARPUR

1. The Cult of Sensibility in Eighteenth Century Novel.
2. The Unconscious in Poetry.
3. Translation of Thoreau's Walden into Hindi.

PHYSICS DEPARTMENT, GOVERNMENT COLLEGE,
HOSHIARPUR

1. Studies on the Directional Intensity of Cosmic Rays.
2. Studies of Nuclear Tracks in Photographic Emulsions.
3. Measurements on Di-electric constants of Molecular compounds.
4. Work on Ultrasonics.

DEPARTMENT OF PHARMACEUTICS, MEDICAL COLLEGE,
AMRITSAR.

1. Synthesis of new local anæsthetics.
2. Extraction of the active principle of Sarphunka. (*Tephrosia Villosa*).
3. Evaluation of various esters of coniferyl alcohol as anti-septics.

CHEMISTRY DEPARTMENT, GOVT. COLLEGE,
HOSHIARPUR

1. Effect of Heat on some constants of Ghee (Butter-Fat) (*Ind. Jour. Med. Res.* 38, 3, July 1950).
2. The Equilibrium of Ternary System, Antimony-Cadmium-Bismuth (*East Punjab University Bulletin*).
3. Potentiometric Studies in Oxidation-Reduction Reactions.
4. Per-Iodates of Thorium and Uranium.
5. Action of Hydrogen Sulphide on Manganese Dioxide.
6. Synthesis of quinasoline derivatives with a view to find new antimalarials.
7. Synthesis of new sulphonamides in order to find new anti-septics.

8. Synthesis of physiologically active ethers.
9. Studies in hygrometric properties of capillary systems.
10. Effect of water on soils under different conditions.
11. Interaction of ferroaluminosilicates with acid solutions of different pH values.
12. Action of KMnO_4 on lactose-a new method for the determination of lactose in milk.
13. Iodine absorption of casein in milk.
14. Colloidal behaviour of charcoal.

CHEMICAL TECHNOLOGY DEPARTMENT, DELHI
POLYTECHNIC, DELHI

1. Addition of Phenols to drying oils.
2. Extraction of the proteins from the mustard seed-oil-cakes.

PHARMACOGNOSY AND PHARMACEUTICAL CHEMISTRY
DEPARTMENT, KHALSA COLLEGE, AMRITSAR

1. Some Pharmacognostical observations on Colochicine containing plants.
2. Pharmacognosy of mucilaginous seeds of India.
3. Pharmacognosy of some Indian substitutes of the Male Fern.

PATNA

MEDICINE

1. Anæmias of Behar.
2. Etiology of Carcinoma.

CHEMISTRY

1. Inorganic Complex compound with quinoline base.
2. Metallic Amines.

MATHEMATICS

1. Some topics in Number theory.
2. Studies in asymptotic lines and generators of a surface and generation of certain scrolls.

P S Y C H O L O G Y

1. Influence of degrees of success and failure on learning and recall of subsequent tasks.
2. Study of level of aspiration of Indian students and a comparative study with American students.
3. (a) Group Tension.
(b) Social and Cultural life of Adivasi.
(c) Public opinion.
4. Determination of norms in Rorschach Inkpot Test for school children in Behar.
5. Some problems connected with personality.

E C O N O M I C S

1. Industrial Labour in Behar.

RAJPUTANA

ARTS

E N G L I S H

1. The drama of Sentiment in the Eighteenth Century.
2. Influence of court on English Literature.

H I N D I

1. The Evolution and the form of Nationalism in Modern Hindi Literature.
2. Art and aesthetics in the Riti Literature of Hindi.
3. Influence of Sanskrit Literature on Hindi Literature.
4. Mahakavi Maithili Saran Guptaji-ke-Kavya Sambandhi Roop Vidhan ka Kram Vikas.
5. Mahakavi Hariodh ki Kavya men Ras aur Riti ke prayog.
6. The modes of Symbolism in Modern Hindi Poetry.
7. A study of the Renaissance of Hindi Poetry in the Divivedi period (1901-20 A.D.).
8. Hindi ka adhunik sahitya aur prosa.
9. Development of Humour in Hindi from Bhartendu.
10. The one Act play in Hindi.

11. A study of the influences and reactions in the development of Nagridas poetry.
12. Philosophy of Life in Prasad Literature.
13. Investigation and Scientific study of Rajasthani Proverbs.
14. Adhunik Hindi kavita me 'Vada pravaha'.
15. Development of the Essay in Modern Hindi.
16. Jaishanker Pershad : His Philosophy of Life.
17. Traditions and creations in the work of Prem Chand.
18. Bhakti kalin Sahitya men prem ke vividh prayog.
19. The History and Growth of Prose Literature in Rajasthan.
20. Trends of thought in Hindi Literature from 1870 to the present day.
21. Rajasthan ke dvara Hindi Sahitya ki seva tatha unka sahityika mulyaupma.

HISTORY

1. Feudalism in Rajasthan.
2. Mewar in Pre-Mughal India.
3. The Democratic Principles in ancient India.
4. The establishment of British supremacy in Bengal, or Bengal from Plassy to Buxar.

ECONOMICS

1. Industrial development in the principal States of Rajasthan during 1930-48.
2. Industrial Evolution in India,
3. Economic development of Jaipur State during the last 40 years.
4. The changing pattern rural of economy.
5. Economic survey of the Alwar District.
6. Economic History of Rajputana.
7. Economic conditions in Rajasthan.

PHILOSOPHY

1. The Neo-Vedantic movement in contemporary Indian philosophy and its future.
2. Absolution in the East and the West.

PATNA UNIVERSITY

P O L I T I C S

1. Administrative system of Jaipur State since 1800-A.D.

S T A T I S T I C S

1. Some aspects of sampling.

C O M M E R C E

1. A study of Public Finance in Rajasthan.
2. Industrial combinations in India.
3. Transfer of British Business to Indians.

M A T H E M A T I C S

1. Integral and its Generalisation.

S C I E N C E

Z O O L O G Y

1. Studies on the minute anatomy of the Amphibian heart.
2. Studies on the Peristaltic Mechanism of Indian earth worms.
3. Studies on the Cranial Morphology of Sauria.
4. A systematic and Ecological survey of the Termite Fauna of Rajasthan.
5. Forest Products of Matsya Union.

SAUGAR

A R T S

E N G L I S H

1. The Problem of the Personal element in Poetry with special reference to the poems of Keats and Shelley.
2. Critical presuppositions of Aesthetics.
3. Symbolism in Modern Drama.

H I S T O R Y

1. British Relations with Indian States from 1805 1835.

SCIENCE

CHEMISTRY

1. Complex Salts.
2. Chemical Kinetics.
3. Colloids.
4. Photochemistry.
5. Super-saturated solution.

The following papers have either been published or are in process of communication :—

- (i) Physico chemical studies in the formation of complex stannic oxalates part I. Conductometric study of the $\text{Sn (OH) 4-H}_2\text{C}_2\text{O}_4$ system. (*J. Ind. Chem. Soc.* Dec.'48.)
- (ii) Physico chemical studies in the formation of complex stannic oxalates part II. Solubility and absorption study of $\text{Sn (OH)4-H}_2\text{C}_2\text{O}_4$ system. (Communicated. *J. Ind. Chem. Soc.*)
- (iii) Application of the solubility method for the elucidation of the composition of some complex compounds of silver part I. Study of $\text{Ag Cl-Na}_2\text{S}_2\text{O}_3$ system. (*Proceedings Indian Science Congress* 1949).
- (iv) Application of the solubility method for the elucidation of the composition of some complex compounds of silver. Part II—Study of $\text{Ag.Br—Na}_2\text{S}_2\text{O}_3$ system. (*Proceedings Indian Science Congress* 1949.)
- (v) Application of the solubility method for the elucidation of the composition of some complex compounds of silver. Part III—Study of $\text{Ag}_3\text{Cit—Na}_3\text{Cit}$ system.
- (vi) Kinetics of Acetone and Iodine reaction. (*Current Science*).
- (vii) Note on the study of the formation, stability and behaviour of yellow mercuric iodide in presence of gelatine. (Communicated Science Congress. 1950.)
- (viii) The* reaction between hydroxylamine hydrochloride and Iodine in presence of HCl. (Communicated Science Congress. 1950.)
- (ix) Studies in the physical properties of colloidal solutions. Part I. (Communicated to the Academy of Science U.S.S.R.)

- (x) Studies in the surface tension measurements of some colloidal solution.

B O T A N Y

1. Ecological account of vegetation of Sagar lakes.
2. Ecology of Plateau-vegetation in Sagar.
3. Autecology of *Auisochilus eriocephalus*.
4. Grassland ecology.
5. Autecology of *Lindenbergia Polyantha*.
6. Floral anatomy of *Boerhaavia repanda*.

Z O O L O G Y

1. Development and morphology of chondro cranium of *Opriocephalus punetatus*.
2. Dev. of chondrocsa.
3. Morphology and bduomics.
4. Acanthaceptan.

G E O L O G Y

1. Studies in the Micro-fossils from Bagh Beds.
2. Microfossils from the Frog Beds, Worli Hill, Bombay.
3. Rhynchonellids from the South Indian Cretaceous strata.
4. Basic and Ultra-Basic rocks from the Wainganga Valley, Madhya Pradesh.

TRAVANCORE

S C I E N C E

DIVISION OF APPLIED BIOLOGY

Economic Botany Section.

1. *Improvement of the Paddy Varieties of Kayamkulam.*
 Pure line section for higher yields in
 (a) Chamba (local double crop variety)
 (b) Cherumony (do)
 (c) Mundakan (Local single crop variety).
2. *Hybridisation in paddy.*

Hybridisation and selection from among the progenies of the local chamba crossed with a Siam variety.

3. *Inheritance of characters in rice.*
The auricle, its presence or absence in rice.
4. *Introduction of exotic strains*
(a) Siam varieties.
(b) Saline resistant varieties of paddy belonging to other parts of India and Indo China.
5. *Sesamum crop improvement by pure line selection in the local varieties.*
6. *Experimental cultivation of virginia tobacco, (Harrisons Special), in this locality.*
7. *Breeding for disease resistance in vegetables.*
(Hybiscus exculenthus for virus resistance).
8. *Experiments with phytohormones.*
(a) to induce rooting in the cuttings of Artocarpus integrifolius.
(b) Effect a phytohormones on the growth and yield of paddy.
9. *Experiments on the treatment of seed (paddy) rather than soil for plant food deficiencies.*
10. Tapioca (Manihot Utilissima).
11. Sweet Potato (Ipomea Batatas), Plantains (Musa Paradisiaca), Pine Apples.
12. Dioscorea, Colocasia, Colens.
13. Tobacco (Nicotiana Tabacum).
14. Ocimum Basilicum (Camphor yielding plant.)

ENTOMOLOGY SECTION

ZOOLOGY

Agricultural Entomology.

1. Note on the occurrence of the weevil *Diocalandra stigmati-collis* Gyll as a pest of the coconut palm in Travancore. (Work completed).
2. Studies on *Tetroastichus* sp., a chalcid pupal parasite of many lepidoptera.
3. Studies on Insect pests of sweet potatoes and their control.
4. Seasonal variation in starch and sugar content of bamboos,

and their correlation with incidence of attack by insect borers in felled bamboos.

5. Bionomics and control of the Rice Swarming Caterpillar, *Spodoptera mauritia*.
6. Bio-assay of certain halogenated hydrocarbon compounds (synthesised in the Central Research Institute, Trivandrum).
7. Biological control of the fluted scale pest, in the High Ranges in Travancore-Cochin (Completed).

MYCOLOGY SECTION

1. Soil Fungi of Travancore with special reference to the Coconut tracts.
2. Wilt disease of the coconut palm.
3. Wilt disease of Tomato.
4. Wilt disease of *crotalaria* sp.
5. Mosaic of cowpea.
6. 'Phyllody' of Sesamum.

DIVISION OF APPLIED CHEMISTRY

1. *Chemistry and Technology of shark liver oil.*
 - (a) Antioxidants for shark liver oil.
 - (b) Synergic action of antioxidant substances on substrates of shark liver oil.
 - (c) Deodorisation of shark liver oil by selective hydrogenation techniques and by agitation with fermenting media.
 - (d) Application of the Bellier figure to ascertain the extent of adulteration in shark liver oil.
 - (e) Application of the "Hydrolytic Index" to determine the extent of adulteration in shark liver oil.
 - (f) Lipolysis of shark liver oil.
 - (g) Preparation of malted shark liver oil and unguents from shark liver oil.
 - (h) Preparation of halogenated compounds from low grade shark liver oils.

2. *Fishery Technology and Chemistry.*

- (a) Turtle oil—deodorisation, stability studies and utilisation.
- (b) Nutritive value of food fishes of the Travancore coast.
- (c) Utilisation of sragassum seaweeds—preparation of alginic acid and mannitol from seaweeds.
- (d) Ballistics liver oil.
- (e) Hydrological conditions of pearl spot culture.
- (f) Investigation on the rate of growth of mullets in waters containing different concentrations of nitrate and phosphate.
- (g) Variation in the hydrological conditions of the Trivandrum coast during 1948-49.
- (h) Optimum conditions for curing red perch.
- (i) Heat insulating materials for fish transport.

3. *Research on plant products.*

- (a) Chemical examination of the bark of *Helitrix isora*.
 - (b) „ roots of *Tilicora racemosa*.
 - (c) „ tuberous roots of *C. Burmanni*.
 - (d) „ the water soluble polysaccharides of *Strychnos potatorum*.
 - (e) „ pods of *Parkia biglandulosa*.
 - (f) Preliminary chemical examination of the officinal parts of the following plants, in connection with the scheme of Pharmacognostic studies :—
1. *Tinsopora cordifolia*, stem and roots.
 2. *Tinsopora malabaricum*, stem.
 3. *Albizzia lebbeck*, stem bark.
 4. *Albizzia odoratissima*, stem bark.
 5. *Albizzia stipulata*, stem bark.
 6. *Oroxylon indicum*, root bark and stem bark.
 7. *Ichnocarpus frutescens*, roots.
 8. *Aegle marmelos*, roots.
 9. *Premna scratifolia*, roots.
 10. *Premna coriaceae*, roots.
 11. *Coscinium fenestratum*, stem.
 12. *Abrus precatorius* (red seeded), roots.
 13. *Arbus precat rius* (white seeded), roots.

14. *Cissampelos pareira*, tuberous roots.
15. *Calotropis gigantea*,
16. *Ipomea paniculata*.
17. *Glycyrrhiza glabra*.
18. *Stercospermum tetragonum*.
 - (g) Chemistry of the essential oils of cloves, nutmeg, etc.
 - (h) Chemical examination of *spatholobus* resin.
4. *Vegetable oils*
 - (a) Stability studies on coconut and gingelly oils.
 - b) Glyceride composition of the oil of *Spatholobus roxburgii* and *Pithecolobium saman*.
 - (c) Deodorisation of vegetable oils.
5. *Soil Science*.
 - (a) Studies on soil phosphorus.
 - (b) Studies on the assimilation of nutrients by the tapioca plant.
 - (c) Microbiological studies on the 'Kari' (peaty) soils of Travancore.
 - (d) Studies on alkali soils.
 - (e) Methods of reclamation of acid soils.
 - (f) Utilisation of Trichinopoly Phosphatic Nodules.
 - (g) Studies on the effect on crop yields of the pre-treatment of seed with nutrient solutions.
6. *Miscellaneous*.
 - (a) Organic compounds of cerium, zirconium and titanium.
 - (b) Organic sulphur compounds.
 - (c) Synthetic herbicides.
 - (d) Investigation on some Travancore minerals.
 - (e) Chemical composition of different varieties of tapioca tubers.
 - (f) Wood tar products and their utilisation.
 - (g) Studies in water purification.

DIVISION OF MARINE BIOLOGY & FISHERIES

1. Studies on the otoliths of Indian fishes.
2. Seasonal distribution of fishes on the Cape Comorin Coast.

3. Biology and Fisheries of *Mytilus* in Travancore.
4. Life history of *Pericliminus grandis*.
5. Brackish water fauna of Kayamkulam backwaters.
6. Bionomics and rate of growth of some brackish water fishes.
7. Vertebral variation in teleostean fishes.
8. Studies on the morphology of the air bladder of fishes.
9. *Thaliacea* of the Travancore coast.
10. Comparative study of the fish skulls in relation to mode of fishing.
11. Foraminifera of the Travancore coast.
12. Morphology of a brackish water *Polycheata*
13. Bionomics and life history of the Aquatic larvae of insects.
14. Life history and systematics of the Fresh water mites of Travancore.
15. Embryology and development of *Macropodus cupanus*.
16. Insect pests of stored fish.
17. Cestode, Nematode and trematode parasites of food fishes.
18. Phytoplankton intensity of Trivandrum coast in relation to phosphate and nitrate contents of sea water.
19. Marine algae and sea weeds of the Travancore coast.

DIVISION OF PREVENTIVE MEDICINE

1. Contribution to the toxicology and the antibiotic activity of indigenous plants.
2. Synthetic media for the growth of microorganisms.
3. The Thiamine nutritional status of Indian adults.
4. Studies in Medical Protozoology.
5. Bionomics and systematics of mosquitoes occurring in Travancore Cochin.
6. Chemistry and Pharmacology of vegetable drugs.
7. Anti-biotics.

DIVISION OF MINERAL SURVEY & RESEARCH

1. Detailed study on the 'teris' of S. Travancore.
2. Problem of primary and detrital laterites.
3. Re-examination of the distribution of the tertiary rocks in South Travancore.

4. Petrology and Petrography of the archaean metamorphic rocks in parts of South Travancore.
5. Detailed study on the beach sands at Manavalakurichi and adjoining coastal parts of S. Travancore.
6. Investigations on the occurrence of a radio-active Columbite in Central Travancore, and a detailed study of the pegmatite relating thereto.
7. Petrology and petrography of the rocks around Cape Comorin in S. Travancore.
8. Investigations on the occurrence of limestones near Cape Comorin.
9. Detailed study of the beach sands in Cape Comorin.
10. Investigations on the occurrences of zircon crystals in S. Travancore.
11. Heavy mineral investigations on primary and detrital laterites in S. Travancore, bearing on the possibility of distinguishing the two laterites with reference to their mode of formation and also to study the mineralogical transformations during lateritisation.
12. Detailed study of the beach sands near Colachel, in S. Travancore.
13. Correlation of the Tertiary outliers in a part of S. Travancore, based on heavy mineral and lithological investigations.
14. Detailed study on the black sand concentrates around Kovalam in S. Travancore.
15. General features of the raised beaches in a part of the S. Travancore coast.

DIVISION OF STATISTICS

1. Sampling Theory.
2. Studies in Statistical methods.
3. Matrix Methods in Statistics.
4. Distribution Functions.
5. Testing Hypothesis.
6. Design of Experiments.
7. Sequential Analysis.
8. Order Statistics.

9. Economic Statistics and Econometrics.

DEPARTMENT OF PHYSICS, UNIVERSITY COLLEGE

1. Modified Reflection of X-rays by carbon-silicide.
2. Retting of cocoanut husks—the tensile strength of coir fibre.
3. Elliptic Polarisation of Light Scattered by Perspex glass.
4. Studies in light-scattering by glasses and liquid mixtures.
5. Radioactivity of Spring waters.
6. Radioactivity of minerals found in Travancore.
7. Spectroscopy of Thorium.
8. Raman spectrum of crystalline salts by ultra violet excitation.
9. Supersonic velocities in liquids and liquid mixtures.
10. Variation of elastic moduli of wires with diameter.
11. Structure of liquids.

DEPARTMENT OF CHEMISTRY, UNIVERSITY COLLEGE

1. A chemical examination of the resin and fixed oil of *calophyllum Inophyllum*.
2. The sterol of the root bark of *Nerium odorum*.
3. Chemical examination of the root bark of *chonemorpha macrophylla*.
4. A chemical examination of the lacquer-bearing trees of Travancore, of the Holygarna and semecarpus series.
5. Fixed oil from the seeds of *Manihot Utilissima*.
6. Colouring matter from the flowers of *Peltaphorum*.
7. Chemical examination of the seeds of *Solanum Insamum*.
8. Resin from the seeds of *Vateria Indica*.
9. An orange coloring matter under the bark of old jack trees, *Arto carpus Integrifolia*.
10. Chemical examination of the leaves of *Pavetta Indica*.
11. Chemical examination of the root bark of *Salacia Oblonga*.
12. Colouring matter in the bark of *Mangiferra Indica*.

DEPARTMENT OF ZOOLOGY, UNIVERSITY COLLEGE

1. Later development of the mesoderm in *Caridina laevis*.
2. The development of *Palamnacus*.

3. Embryological and Cytological studies on Gall midges.
4. Embryology of parasitic Isopoda.
5. Embryology of *Paratetraphusa*.

DEPARTMENT OF BOTANY, UNIVERSITY COLLEGE

1. Genetical and Cytological studies on Tapioca (*Manihot utilissima*).
2. Interspecific hybridisation work on *Manihot* species.
3. Breeding work on Tapioca varieties.
4. Anatomical studies on Tapioca tubers.
5. Cytological and genetical studies on artificially produced polyploids in Tapioca, and evolving of different chromosomal races of this plant.
6. Cytological and genetical studies on *Ipomea* species.
7. Breeding work on *Ipomea batatas* (sweet potato).
8. Intervarietal and interspecific hybridisation in *Ipomea*.
9. Classification of varieties of *Ipomea batatas*.
10. Studies on induced polyploidy in certain tuber crops like *Colocasia* and *Dioscorea* and *Ipomea batatas*, to find the relationship between chromosome numbers and tuber yield.
11. Preliminary investigations on a number of indigenous tuber crops.
12. Studies on the Cytology, Taxonomy and distribution of a few genera of the Liliaceae and Commelinaceae.
13. Cytogenetical studies on *Musa* species.
14. Fundamental studies on somatic mitosis in plants in relation to chemical treatments of cells.
15. Anatomical studies on a few indigenous fibre plants of Travancore.

ARTS

DEPARTMENT OF SANSKRIT, UNIVERSITY COLLEGE

(a) *On Purva Mimamsa.*

1. Aim and scope of Purva mimamsa Sastra.
2. Dharma—its definition and authority.
3. Further light on Sankarsakanda.

4. Conception of Bhavana according to Mimamsaka.
5. Nititattvavirbhava of Cidananda—a study.
6. Bhasyadipa—a new commentary on Sabara bhasya according to Prabhakara School.
7. Purva Mimamsa—a metaphysical study of (contributed to Philosophy—Eastern and Western).

(b) *Dharma Sastra.*

1. Dharma sutras and Dharma sastras.

(c) *Prosody.*

1. Janasrayi Chandroviciti—a study.

(d) *General Literature.*

1. Rasamanjari—a new commentary.
2. Contribution of Kerala to Sankrit literature.
3. Naisadhananda of Ksemisvara (9th Century A.D.) To be published for the first time

DEPARTMENT OF MALAYALAM, UNIVERSITY COLLEGE.

1. A critical study of the works of the Niranam school of Malayalam poets.
2. Asan, his mind and Art.
3. Works of Kuncan Nambyar.

DEPARTMENT OF TAMIL, UNIVERSITY COLLEGE

1. Some Aspects of Kerala and Tamil Literature.
2. A survey of Tamil Literature.
3. Botany in Tamil Literature.

UTKAL

SCIENCE

1. Study of Oils in Orissa.
2. Analysis of "Dalda Vanaspaties".
3. Analysis of "Vanaspaties" imported to Orissa.

ARTS

ENGLISH

1. Dynastic history of Sambalpur from the 16th century onwards.
2. Influence of the Marathas on the history of Sambalpur.
3. Orissa under Muslim rule.
4. Maritime activities in ancient Utkal.

F. M. COLLEGE, BALASORE

PHILOLOGY

1. Influence of Non-Aryan Languages over Sanskrit

KHALLIKOTE COLLEGE, BERHAMPUR (GANJAM)

1. Indo-English Literature.
2. Shakespeare and the Indian point of view.

M. K. C. G. COLLEGE, PARLAKIMEDI

1. The early Oriya Literature with special reference to Socio-Economic condition of Orissa as found in the works of the poets supplemented by inscriptions.
2. Indian Theism connected with Tantra.
3. Biochemical study on some organic compounds.

RAVENSHAW COLLEGE, CUTTACK

PHYSICS

1. Life times of mercury and potassium atoms in the excited states.

ENGLISH

1. Modern English Drama.
2. Keats and his Poetry.
3. Jane Austen as a novelist.
4. Gerard Manley Hopkins.

MATHEMATICS

1. A criterion for the absolute conveyance of a Fourier series.

2. The absolute Cesaro sensibility of some series associated with a Fourier series.
3. On the sensibility (R , $\log w$, 1) of a Fourier series.
4. The absolute Cesaro Sensibility of a series associated with a Fourier series.

SRIRAM CHANDRA BHANJ MEDICAL COLLEGE
CUTTACK

P H A R M A C O L O G Y

1. Action of *Pterocarpus Marsupium* on blood sugar.
2. Efficacy of Tobacco leaf in the treatment of Sarcoptic Mange.
3. Efficacy of female sex hormones in the treatment of Peptic Ulcer.
4. Studies on sex hormones—Part I. Sperm test of pregnancy utilising *Bufo melanostictus schneid*, as test animal.
5. Studies on sex hormones—Part II. A new method of Bioassay of Human Chorionic gonadotropin utilising *Bufo melanostictus schneid* as test animal.
6. Studies on sex hormones—Part III. Investigations on the gonadotropic substance present in pregnant cow dung.
7. Studies on sex hormones—Part IV. Further observations on Osterogen on Peptic ulcer.
8. New line of treatment of Portal Cirrhosis of liver.
9. Studies on Antihistamines—Part I. Observations on the treatment of Glokerular nephritis with Antihistamines.
10. Studies on Antihistamines—Part II. Action on isolated human organs.
11. Studies on Antihistamines—Part III. Action on isolated organs of experimental animals.
12. Studies on Antihistamines—Part IV. Action on living experimental animals.
13. Studies on Antihistamines—Part V. In migraine and other allergic conditions.
14. Studies on *Leucas Aspera* Line,
15. A bedside method of estimation of Blood-Urea and comparative study of its accuracy.

CHEMISTRY

1. Mercurated azo-dyes derived from aniline and their action on E. Coli.
2. Mercurated azo-dyes derived from p-acetoxy mercuri aniline and their action on E. Coli.
3. Antagonistic action of PABA and Nicotinic Acid on the antiseptic activity of some dye-stuffs with respect to E. Coli and Staphylococcus.
4. Preparation of—(1) Simple acetoxymmercuri phenols.
(2) Acetoxymmercuri amines.
(3) Chlorommercuri phenols.
(4) Chlorommercuri amines.
5. The uses of some organommercuri compounds as antibacterials—mercurated phenylureas and phenyl thioureas.
6. Metallic complexes of some azo-dyes—phenyl azo-salicylic acid and phenyl azo-oxymes.
7. Some phenyl azo derivatives of Pyrogallol antimonate as potential antiprotozoal drugs.
8. Separation of toxic alkaloid of Argemon oil from mustard oil adulterated with Argemon oil.
9. Behaviour of lead nitrate in aqueous solution.
10. Potentiometric estimation of thiocynate ions by silver-thiocynate electrodes.
11. Studies in the electrodes of the third order and determination of the solubility product of silver thiocyanate.
12. Nature of the lead acetate in aqueous solutions.
13. Nature of Cadmium acetate.
14. The apparent molal volumes of electrolytes in aqueous solutions.
15. Idometric method of estimation of Iron—use of ammonium molybdate as catalyst.
16. Positive catalysis of Ammonium molybdate in the Dichromate-Iodide reaction.

RESEARCH WORK IN PROGRESS

1. Antibacterial action of—(1) Acetoxymmercuri and Chlorommercuri phenols and (2) Acetoxymmercuri and Chlorommercuri amines on E. Coli and Staphylococcus with or without PABA and Nicotinic Acid.

2. Estimation of Barium with p-chlorophenyl-azo-salicylic acid.
3. Viscosity and conductivity of Cobalt amines at 35°C.
4. Testing Jones Doles Equation with mono-trivalent electrolytes.
5. The composition of Ferric Sulphocyanide.
1. Haematological picture of normal adult people in Orissa.
2. Normal Electro-cardiogram in Orissa, Ibid.
3. Improvised Electrode Jelly for use with E.C.G.
4. Effects of drugs on heart as revealed by E.C.G.
5. Effect of vitamin B₁ on circulation.
6. Biological value of the common fish proteins in Orissa.
7. Effect of heat treatment and acid extraction on the B. V. of fish proteins and the presence of an anti-enzyme in fish which tends to lower the B.V. by reducing tryptic activity.
8. Tryptophane sparing effect of nicotinic acid and the consequent increase in the B.V. of proteins, poor in tryptophane on addition of nicotinic acid.
9. Transformation in slices of rat's liver of tryptophane to nicotinic acid in presence of vitamins of the B group.
10. A preliminary report on the normal B.M.R. of males of a particular age group in Orissa.

RESEARCH WORK COMPLETED

1. Rooting response of stem cuttings of *Magnolia grandiflora* to synthetic hormones.
2. Studies in Photoperiodism of Indian Vegetables. 1. *Amarantus gangeticus*.
3. Effect of Calcium on the root growth of rice plants.
4. A modified arrangement for the determination of Carbon dioxide given out by plants by electrical conductivity method.
5. Effect of Boron on the catalase activity of rice plant.
6. Effect of temperature on the growth stimulation of rice seedlings by Manganese.
7. Effect of aeration on the growth stimulation of rice seedlings by Manganese, Boron and Copper.

BHANDARKAR ORIENTAL RESEARCH INSTITUTE.

1. Vedic Rishis.
 2. A comparative study of the Sanskrit Dhatupathas.
 3. Pre-shankara Vedanta.
 4. Post-shankara Advaita Vedanta. (dealing with the works and Philosophy of the Post-shankara Advaitins from Sureshvara to the 19th century).
 5. Collecting for the Empire the edition of the Mahabharata Edition, the material on the topics from the Parvans already published Institute. The following topics are now on hand :
 - (i) crafts (including products thereof) and in the Mahabharata and
 - (ii) Arms and weapons in the Mahabharata and
 - (iii) sports, games, etc. in the Mahabharata. Other topics will be taken up in due course.
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H. B. TECHNOLOGICAL INSTITUTE, KANPUR.*Work completed.*

1. The manufacture of electrolytic copper powder (*Jour. & Proc. Institution of Chemists, India, Vol. II, June 48, P. 110-119*).
2. The anodic oxidation and colouring of aluminium and aluminium alloy articles (*Jour. & Proc. Institution of Chemists, India, Vol. XX, June 48, P. 66-89*).
3. The electrodeposition on non-conducting surfaces (*Jour. Indian Chemical Soc., Ind. & News Edition Vol. XI, 1948, P. 123-138*).
4. Studies in the preparation of aluminium solder (*Proc. 37th. Indian Sci. Cong. 1950, Poona Abstracts Part III. P. 158*).
5. Resin from Molasses, sugar and other carbohydrates (*Proc. 36th Indian Sci. Cong. 1949, Allahabad, Abstracts Part III, P. 89*).
6. Organolites in industry (*Proc. 37th Indian Science Congress 1950 Poona, Abstracts Part III, P. 158*).

7. Studies in the preparation of cellulose acetate (*Proc. 36th Indian Sci. Cong. 1949, Allahabad, Abstracts Part III*, P. 89.)
8. Studies in the manufacture of cellulose-aceto-butyrate (*Loc. Cit.* P. 90).
9. Study of Indian Cellulosic raw materials for the manufacture of rayons (*ibid.* P. 90).
10. Plaster for Kaccha-pucca houses (*Proc. 36th. Indian Sci. Cong. 1949, Allahabad, Abstracts Part III*).
11. Survey of reh deposits in U.P. (*Oil Tech. Asson., India*, 1948, Vol. IV).
12. Preparation of substitutes of some pharmaceutical patent medicines (*Indian Jour. Pharmacy*, Jan-Feb. 1949, Vol. XIP.)
13. Preparation of silver proteinates (*Indian Jour. Pharmacy*, Vol. XI, No. 2, 1949, P. 44.)
14. Utilisation of sugar factory bye-products for solving housing problems (*Jour. & Proc. Sugar Tech. Asson. India* 1948, part I.)
15. Possibility of the manufacture of soda ash and caustic soda from the naturally occurring reh deposit (*Jour. & Proc. Institution of Chemists India*, Vol. XX, June 48.)
16. Chemical study of mango kernals (*Proc. 35th Indian Sci. Cong. 1948, Patna, Abstracts Part III*.)
17. Preparation of Gammexane (*Proc. 35th Indian Sci. Cong. 1948, Abstracts part III*.)
18. Utilisation of aeroplane scrap (*HBTI & LIST Old Boys Magazine* 1946-48, P. 33).
19. Tartaric acid from Starch (*Loc. Cit.* P. 63).
20. Utilisation of kans in the manufacture of paper and allied products by (*Indian Pulp and Paper* Nov. 1949, P. 1-4).
21. Component fatty acids of buffalo milk fats (*Jour. & Proc. Institution of Chemists, India*, Sept. 49).

Papers Ready for Publication.

1. Studies in the preparation of photographic plates.
2. Studies in reflex and contact copying.
3. Production of photographic prints on anodised aluminium sheets.
4. Preparation of photographic gelatin.

5. The Chemical toning of photographic prints.
6. The production of multi-coloured effects on anodised aluminium sheets.
7. A study of tanning materials from the barks of some forest trees received from all over India.
8. Preparation of citric from citrus fruits received from Almora district.
9. Preparation of persulphates by electric method.
10. Preparation of Dimethyl sulphate.
11. Preparation of lactose from skimmed milk.
12. Preparation of Plaster of Paris for medicinal purposes.
13. Preparation of acetic anhydride.
14. Preparation of Potassium permanganate.
15. Preparation of hydrogen peroxide.
16. Preparation of chromic anhydride, chromic oxide and chromic alum.
17. Lignine recovery from black liquor.
18. The preparation of fufural from agricultural wastes.
19. Improved method of katha manufacture on the cottage scale.
20. Chemical examination of essential oils from Malta orange skins.
21. Component fatty acids from glycerides of buffalo body fats.
22. Examination of *helicteres Isora*, Linn. fibre and possibility of its use as a jute substitute.
23. A comparative study of agave fibres produced by different methods of retting.
24. Examination of the wild hemp fibre (*Cannabis Sativa* Linn).
25. Studies in the constitution of black seeded and white seeded sunnhemp fibre.

Work under Progress.

1. Cultivation of ocimum plants and study of its chemical composition as well as recovery of camphor.
2. Preparation of synthetic perfumes such as Ionone, Benzyl, Benzoate etc.
3. The preparation and chemical examination of otto de Pandanus or otto of Kewda, otto of Jasmine, otto of Genda, otto of Bela, otto of Harsinghar etc.

4. Cultivation and extraction of peppermint oil from *mentha piperta*.
5. A study of physico-chemical characteristics of rose water with a view to draw their specifications.
6. Chemical examination of the Ciprial oil.
7. Component fatty acids and glycerides of the seed oil from Gulmehdi (*Impatiens Balsamina*).
8. Chemical examination of the essential oils from citrus peels.
9. The electro-colouring of aluminium powder.
10. The preparation of electrolytic golden powder.
11. The preparation of photographic printing paper.
12. The electro-colouring of copper and brass.
13. Edible colours for colouring vegetable ghee.
14. Preparation of sulpha drugs and their intermediants.
15. Substitute for synthetic rubber rolls.
16. The manufacture of glucose from indigenous roots.
17. Utilisation of kans for the preparation of activated carbon.
18. Organic adsorbents from Kutch.
19. Protein resins.
20. Separation of fatty acids by chromatography.
21. Preparation of hydroxy benzyl alcohols.
22. Preparation of phenacetin.
23. Preparation of glycono-phosphates.
24. Preparation of methoxy and ethoxy-analogue of D.D.T.
25. Development of new fibres such as linseed, kapasia and hollyhock and their use as jute substitutes.
26. Preparation of ultramarine blue.
27. Edible sugars from cellulosic materials.
28. Production of salicylic acid and its derivatives.
29. Physiochemical studies in the steam distillation of constituents of essential oils.
30. Production of hydroquinone.

OIL CHEMISTRY AND TECHNOLOGY SECTION H. B.
TECHNOLOGICAL INSTITUTE, KANPUR.

1. Examination of Rohini seed oil (a forest oil-bearing seed) (*Mallatus Philippinensis Mull*)

2. Utilisation of mahuwa cake for the preparation of plastics (*Jl. of Science and Technology, Kanpur* Vol. III).
3. Preparation of oil cloth from indigenous raw material.
4. Vegetable lecithin from castor seed (*Proc. Instt. Chemists*, 1948, XX, 41-43).
5. A study of antioxidants for edible oils.
6. Examination of forest oil bearing seeds, *Aesculus Indica*, Makhan seed and *Jatrophia Enphor biaccaae*,
7. Examination of various oilcakes produced in Uttar Pradesh.
8. Utilisation of *need* fruit for its seed and oil.
9. Tailor made drying oil (alcohol soluble linseed oil).
10. Design of a small solvent extraction plant.
11. Design of a small hand worked filter press, suitable for cottage oil industry.
12. Roller bearings for 'bojhpatt' and 'lot' of the improved Wardha oil Kolhu (*Proc. Oil Tech. Asson.*)
13. Cement concrete 'okhali' for the improved Wardha oil Kolhu (*Proc. Oil Tech. Asson.*)
14. Trials of wooden 'okhals' of shorter diameter in order to meet the shortage of large diameter wood for the 'okhali' of the improved Wardha oil Kolhu.
15. Preparation of 'kotha' of the improved wardha oil Kolhu in more than two parts to meet the shortage of babool wood of requisite diameter.
16. Preparation of medicinal castor oil.
17. Study of Argemone oil with regard to its chemical constants and fatty acid composition.

FOREST RESEARCH INSTITUTE, DEHRA DUN CELLULOSE AND PAPER BRANCH

1. Investigations on the suitability of the following species of woods for the production of newsprint :—
 - (a) *Acacia decurrens* (b) *Sterculia alata*.
 - (c) *Boswellia serrata* (d) *Trema orientalis*.
 - (d) *Sterculia campanulata*.
2. Investigations on the suitability of the following cellulosic raw materials for the production of writing and printing papers.

- (a) *Themeda arundinacea* (b) *Bagasse* (c) *Ailanthus excelsa*
 (d) *Palmyra* stalks (e) *Pinus longifolia* (f) *Trema orientalis* (g) *Excaecaria Agallocha* (h) *Imperata arundinacea*, (i) Jute sticks and (j) Castor stalks.
3. Investigations on the production of semi-chemical pulps from the following :—
 (a) *Acacia decurrens* (b) Hemps (c) *Themeda arundinacea*
 (d) *Pinus longifolia* (e) Barks from *Acacia decurrens* and *Shorea robusta*.
4. Investigations on the production of kraft paper from the following :—
 (a) *Bagasse* (b) *Bambusa arundinacea* (c) *Pinus longifolia*.
5. Investigations on the production of pressed and insulation boards from the following :—
 (a) Spent-tan barks (b) Barks from *Shorea robusta* and *Pinus longifolia*.
6. Investigations on the production of pulp for rayon from the following :—
 (a) *Dendrocalamus strictus* (b) *Arundo donax* and (c) *Phragmites karka*.
7. Investigations on the recovery of alcohol, yeast and vanillin from sulphite waste liquor from bamboo digestions.

CHEMISTRY OF FOREST PRODUCTS BRANCH

A. ESSENTIAL OILS

1. Costus oil from the roots of *Saussurea lappa* C. B. Clarke together with the new solid lactone, separated from this essential oil.
2. Agar oil from the wood of *Aquilaria agallocha* Roxb.
3. Resinoides from khus roots, *Vetiveria Zizanioides* Stapf.
4. Juniper oil from Juniper berries.

B. RESINS AND GUM OLEO-RESINS FROM

5. *Boswellia serrata* Roxb.
6. *Semicarpus travancoricus* Bedd.—nuts of.
7. *Gardenia gummifera* Linn.—leaf buds of.

C. OILS, FATS AND WAXES

8. *Mallotus philippinensis* Muel-Arg. Seed oil.

9. *Sterculia urens* Roxb.—fatty oil from the seeds.

D. PECTINS, GUMS AND MUCILAGES

10. *Tamarindus indica* Linn—kernel powder, tamarind seed jellose, its carboxymethyl ether acetyl derivatives and its partial hydrolysis.
11. *Asparagus tubers* such as
A. flicinus Buch.—Ham., *A. racemosus* Willd *A. adscendens* Roxb. and *Curculigo orchioides* Gaertn. Study of the mucilage.

WOOD ANATOMY BRANCH

1. *Anatomical structure and classification of timbers.*
 - (a) Anatomical studies of the woods of the families *Dipterocarpaceae* and *Malvaceae*.
 - (b) Commercial timbers of West Bengal—their identification, properties and uses.
2. *Studies on Indian substitutes for imported timbers.*
 - (a) Red cutch (*Acacia chundra*)—a substitute for lignum vitae in shipbuilding.
 - (b) Investigation on the suitability of Indian spruce (*Picea morinda*) and fir (*Abies pindrow*) as substitutes for imported silky spruce for aircraft.
3. *Growth studies in Indian trees.*
 - (a) Formation of growth rings.
 - (b) Study of initial parenchyma.
 - (c) Relation between height and diameter growth.
4. *Studies on resin and gum tapping in Indian trees.*
 - (a) Sal (*Shorea robusta*).
 - (b) Karrar (*Sterculia urens*).
5. *Investigation on the suitability of Indian timbers for the production of cellulose.*
6. *Studies of fossil woods, and archaeological specimens.*

BOTANY BRANCH

Systematic Botany.

1. Plants of forest importance: Illustrations and descriptions of Indian plants of forest importance imperfectly known hitherto.

2. The study of various forms of Mesquite (*Brosopis juliflora*) grown in India.
3. Investigation of 'Red Cutch' as a substitute for Lignum vitae used in ship building.
4. A systematic study of the Indian living Gymnosperms.
5. Name-changes in Indian Plants.
6. The study of Indo-Burmese Forest grasses.

List of publications :—

1. A new *Senecio* from Assam. (*Jour. Ind. Bot. Soc.* Vol. XXVII, No. 4, p. 206-207 1948).
2. A case of teratology in *Eriocaulon* (*Science & Culture* Vol. XIV, No. 9, p. 387-388 1949).
3. Botanical name changes (*Ind. Forester*, Vol. 74, No. 9, pp. 333-336 1948).
4. New or little known plants from Assam (*Ind. For.* Vol. 74, No. 11 pp. 385-392 1948).
5. Some interesting plants from Orissa (*Jour. Bombay Nat. Hist. Soc.* Vol. 48 (4): pp. 667-680 1949).
6. An interesting case of Botanical Nomenclature (*Science & Culture*, Vol. 14, pp. 476-477 1949).
7. Correct name of Indian Silk Cotton Tree (*Ind. For.* Vol. 76, No. 4, pp. 154-155 1950).
8. A new species of *Dimeria*, *D. moorei* (*Supplement to the Botany of Behar and Orissa* 1950).
9. Review of Supplement to the (*Botany of Bihar and Orissa Ind. Forester* 76, 9, 1950, p. 403).
10. Name changes in the genera *Eugenia* and *Atylesia* (*Suppt. to the Botany of Bihar & Orissa* 1950).
11. *Lilium mackliniae* discovered earlier in Burma (*Gardner's Chronicle* CXXVII, No. 5711, 150 p. 247).

In the press :—

12. Corn Cockle, a poisonous weed in imported wheat (*Indian Farming*).
13. The genus *Aegopodium* (*Jour. of Ind. Bot. Soc.*).
14. Two little known plants from India (*Indian Forester*).
15. Review of some name changes in Indian Grasses (*Current Science*).

16. New or noteworthy plants from Upper Gangetic Plain
(*Ind. For. Records, Botany Series*).

Indian Forest Bulletins (New Series).

138. 1948. The determination of the characteristics of soil suitable for Sal (*Shorea robusta*).
141. 1948. Soils in relation to teak with special reference to laterisation.

Indian Forest Records (New Series).

- 7 (1) 1948. Seed storage with particular reference to the storage of seed of Indian forest plants.
8 (1) 1950. *Aleurites Fordii*, Hemsl.

Manuals.

1950. The Silviculture Research Code. Vol. 3. The Tree and Crop Measurement Manual.
1948. Manual of General Silviculture for India.

BRANCH OF FOREST ENTOMOLOGY

1. Ecological study of borers of freshly felled timbers of commercial importance, covered wood of all kinds, plywood and bamboos and their measures of control by silvicultural, mechanical and chemical methods, at Dehra Dun and in other parts of India.
2. Ecological study of the defoliators of teak, deodar, kail and silver fir in South India and Himachal Pradesh and their measures of control by silvicultural, chemical and biological methods.
3. Insect pests of forest seeds ; to determine the species involved and the extent of damage caused by them in India.
4. Investigation to determine the efficacy and strength of various insecticidal materials, e.g., DDT, BHC, Copper naphthanate, Pentachlorophenol, etc., in the control of forest insects.
5. Taxonomic description of immature stages of pest species and their allies and associates with particular reference to insects of importance to forestry.

6. Systematic study and control of Indian termites.

COMPOSITE WOOD BRANCH

1. Development of adhesives
 - (a) from vegetable proteins like seed of *Lathyrus Sativus*, *Terminalia belerica* and blood meal.
 - (b) from Cashew nut shell liquid, etc.
2. Storage life of resin adhesives.
3. Durability of various types of adhesives under extreme service conditions.
4. Influence of psychrometric conditions on the setting time of adhesives.
5. Accelerated methods of setting of adhesives.
6. Weathering trials and insulation tests.
7. Production and testing of various forms of improved wood, plywood etc.
8. Physical properties of improved wood.
9. Movement of gases, liquids, ions, etc. through wood and Composite Wood.
10. Production of building boards from bamboos, wood waste, etc.
11. Chemistry of wood and bark and wood plastics.
12. Biochemistry of Indian fungi.
13. Testing of preservatives.
14. Treatment of wood with preservatives.
15. Fire retardent treatments.

MYCOLOGY BRANCH

TREE DISEASES

1. Fungus diseases of Sal (*Shorea robusta*) : Detailed investigations on the biology and pathology of fungi causing important diseases of sal are investigated under this project.
2. Wilt of Casuarina : Wide spread mortality of *Casuarina - equisetifolia* due to *Trichosporium vesiculosum* is being investigated with a view to suggest control measures.
3. Diseases of other hardwood trees : Mortality of hardwoods with special reference to Shisham, Babul, and Khair is dealt with.

4. Diseases of conifers : Diseases of conifers, namely, deodar, spruce, fir, chir and blue pine, are dealt with under this project.

TIMBER PATHOLOGY

1. Study of wood-rotting fungi. All wood-rotting fungi belonging to Hymenomycetes are studied, as to the character of sporophores.
2. Taxonomic studies on *Poria* and *Thelephoraceæ*.

TOXICITY TESTS

Tests to determine the toxicity of various chemicals to test fungi in the laboratory prior to use of these chemicals as wood preservatives.

Publications during June 1948 to May 1950.

1. Report of the Deputation of Dr. K. Bagchee, to the Commonwealth Mycological Conference held in London and visit to the Continent of Europe, U.S.A. and Canada from 19th July, 1948 to 1st January, 1949.
2. Toxicity Tests by Woodblock Method.
-(*Indian Forester*. April, 1950).
3. Progress of Forest Pathology in India during the Quinquennium 1944-49. (*Ind. For.* May, 1950).
4. "Common names of Indian plant diseases.

MINOR FOREST PRODUCTS BRANCH

SURVEY OF COMMERCIAL MINOR FOREST PRODUCTS

(a) *Drugs.*

1. *Artemisia* (*Artemisia maritima* L. forma *rubricaule* Badhwar and *A. brevifolia* Wall).
2. *Ephedra*
3. Sarpagandha roots (*Rauwolfia serpentina* Benth ex. Kurz).

(b) *Tanning Materials.*

4. Avaram bark (*Cassia auriculata* L.)
5. Babul bark (*Acacia arabica* (Lam.) Willd).
6. Myrobalan (*Terminalia chebula* Retz).

(c) *Gums, Mucilages and Pectins.*

7. Tamarind Seed (*Tamarindus indica* L.)
8. Karaya gum (*Sterculia urens* Roxb.)
9. Kino gum (*Pterocarpus marsupium* Roxb.)
10. Ghatti gum (*Anogeissus latifolia* Wall.)
- (d) *Resins.*
11. Bhilawa nut (*Semicarpus anacardium* L. f and *S. travancoricus* Bedd.)
- (e) *Essential Oils.*
12. Cinnamon leaf oil and bark (*Cinnamomum zelanicum* Bryn.)
13. Citronella oil (*Cymbopogon nardus* Rendle).
14. Rosha or Palmarosha oil (*Cymbopogon martini* stapf var. *motia*).
15. Ginger grass oil (*Cymbopogon martini* stapf var. *sofia*).
16. Lemon grass oil (*Cymbopogon citratus* stapf and other spp)
- (f) *Fibres and Flosses.*
17. Indian Kapok (*Bombax malabaricum* DC.)
18. Kitool fibre (*Caryota urens* L.)
- (g) *Oils and Fats.*
19. Lauric acid (from seeds of *Lauraceae* family).
20. Illipe nuts (*Madhuca butyraceae* Roxb.)
21. Piney tallow (*Vateria indica* L.)
22. Kokum butter (*Garcinia morella* Desr.)

CULTIVATION OF ECONOMIC PLANTS

Optimum conditions for the cultivation of the following plants are being studied :—

1. Camphor yielding ocimum (*ocimum kilimandscharicum* Guerke)
2. *Rauwolfia serpentina* Benth. ex. Kurz.
3. *Eucalyptus australiana* R.T.B. & H.G.S.
4. *E. cheorifolia* DC.
5. *E. polybrata* R.T.B.
6. *Atropa belladonna* L.
7. *Hibiscus abelmoschus* L.
8. *Chenopodium ambrosioides* Linn. var. *anthelmintica* A. Gray.
9. *Glycyrrhiza glabra* Linn.
10. *Rhamnus Purshiana* DC.

P H A R M A C O G N O S Y

Pharmacognosy of *Ocimum Kilimandscharicum* Guerke, *O. canum* Sims, and *O. basilium* Linn., with a view to distinguishing the raw material of camphor-yielding plant from non-camphor yielding species of the same genus.

Soil Stabilization.

Investigation of the soil stabilizing performance of different common plants and the reduction of the cost of construction of stabilized earth construction.

Monographs in Preparation.

1. *Poisonous Plants of India* - 2nd Vol.
2. *Aromatic Plants of India.*
3. *Vegetable Tanning Materials of India and Burma.*

List of Publications.

- (1) *Aromatic Plants of India*, Parts V - XIV (*J. Sci. & Induser. Res.*, Supplement pp. 77-100).
2. Camphor—Its possible sources and production in India (*The Indian Forester*. 76 No. (4) pp. 139-143.)
3. Indian Canes (Rattans). (*The Indian Forester*. 76 (4) pp. 159-163).

WOOD SEASONING BRANCH

- (i) *Timber Physics* (Study of physical properties of Timber).

Shrinkage, swelling, and hygroscopic behaviour of wood; electrical conductivity of bamboo; moisture distribution and cracking in wood; effect of corrosive chemicals on mechanical properties of timber; moisture proofing efficiency of various paints.

- (ii) *Seasoning Technique.*

Study of air and kiln drying characteristics of timbers; girdling of standing trees; seasoning of veneers and conditioning of plywood; operation of steam and furnace kilns; seasoning of railway sleepers; seasoning of timber utilizing sun's energy.

(iii) *Industrial Investigations.*

Seasoning and suitability of Indian woods for textile and jute mill accessories, battery separators, pencil making and storage vats. Steam bending properties of wood.

INDIAN DAIRY RESEARCH INSTITUTE, BANGALORE**DAIRY CHEMISTRY**

1. Studies on enzymes in milk and milk products.
2. Amino acid make up and nutritive value of proteins of buffalo and cow milk.
3. Non-protein Nitrogen of milk.
4. Chemical composition and growth-promoting value of fractions of cow ghee prepared by cold crystallisation.
5. Nutritive value of *Vanaspati*.
6. Chemical changes in milk constituents during souring.
7. Effect of heat on the chemical constants of fresh, high acid and rancid ghee.
8. Keeping quality of butter and ghee.
9. Vitamin B complex in milk—Investigation on thiamine, riboflavin and nicotinic acid.
10. Experiments on the colouring of *Vanaspati*.
11. Seasonal changes in the composition of cow, buffalo, goat and sheep milk fat.
12. Storage of curd and acidity in ghee.
13. Chemical composition of butterfat secreted by different quarters of the udder.
14. Carotene and vitamin A potency of milk and butterfat at different levels of carotene intake and the utilization of feed carotene and general composition of prepartrum milkfat.
15. Nutritive value of milk and *dahi*.
16. Lipoids and Cholesterol in milk.
17. Effect of iodinated casein on the growth of calves.
18. Colour in ghee prepared by indigenous method.
19. Colostral fat of goats and sheep.

20. Sesaonal variation in the carotene and vitamin A content of butterfat of cows and buffaloes.
21. Nutritive value of Indian dairy products.
22. The effect of nicotinic acid administration on the yield of milk and its composition.
23. Nutritive value of cow milk subjected to different heat treatments.
24. Effect of different milk supplements on the poor South Indian diet.
25. Freezing point of milk and its applicability to detect adulteration in milk.
26. Preservation of milk by hydrogen peroxide.
27. Pasteurisation of milk by ultra-violet irradiation.
28. Preparation of *Khoa* from acid milk by using sodium acetate.
29. Composition of *Khoa* or *Mawa*.
30. Preparation of vegetable rennet from *Withania coagulana* and its use for preparing cheese.
31. Testing the important standard methods for the analysis of milk, ghee and other milk products.
32. Composition of milk of different species.

DAIRY BACTERIOLOGY

1. Bacterial flora of raw and heated milks.
2. Incidence, distribution and biochemical activity of coliform bacteria in milk.
3. Incidence, distribution and biochemical activity of spore-forming bacteria in milk.
4. Bacteriology of boiled milk.
5. Incidence, distribution and biochemical activity of micrococci in milk.
6. Bacteriological quality of market milk at Bangalore and Lucknow.
7. Studies on the udder microflora of Indian cows.
8. Bacteriological studies on the preservation of milk by use of hydrogen peroxide.
9. Effect of abnormal milk on the growth of starter organisms.
10. Studies on the resazurin reduction of milk.

11. Applicability of dye reduction tests to bacteriological quality control of milk.
12. Applicability of resazurin reduction test for estimating sanitary condition of utensils on a farm.
13. Influence of pre-storage temperatures of milk on its resazurin and methylene blue reduction time.
14. Biochemical studies on dahi.
15. Microbiological assay of B-complex vitamins in milk and milk products.
16. Vitamin B12 activity of milk.
17. Utilisation of colostrum milk for making *dahi*.
18. Studies on the use of some lactic acid bacteria for enriching the nutritional properties of *dahi*.
19. Studies on the production of diacetyl in milk.
20. Studies on the desiccation of starter cultures used for dahi.
21. Microflora of *desi* and creamery butters.

DAIRY TECHNOLOGY

Market Milk.

1. Studies on the storage property of heat-treated milk.
2. Studies on the effect of age on the market quality of milk under different methods of processing and storage.
3. Studies on the bacteriological and biochemical aspects of processing of market milk.
4. Studies on the different aspects of production, collection and processing of village produced milk for urban supply under the organisational set up of a typical Cooperative Milk Supply Union.
5. Studies on the methods of transport of milk over long distances in a built-in processing-cum-transport vehicle under field conditions.
6. Design for tamper-proof devices in distribution cans to prevent adulteration of milk.

Ghee & Butter.

7. Studies on the *desi* curd process of ghee manufacture with special reference to the technological facts such as washing of butter and use of an improved gear type paddle churn.

8. Studies on the utility of an improved gear churn for the dual purpose of churning curd and cream.
9. Efficiency of the 'end-over-end' hand churn in the churning of different types of cream.
10. Effect of neutralisation of high acid cream on the quality of butter.
11. Studies on the direct-cream-heating method of ghee manufacture.
12. Studies on the physico-chemical factors involved in the washing of cream preparatory to its conversion into ghee.
13. Studies on the 'hay-box' method of preservation of milk-its effect on ghee production.
14. Studies on the utilisation of induced stratification of butter melt in ghee making.
15. Studies on the standardisation of technique of ghee manufacture to improve its market quality.

Other Milk Products.

16. Studies on the village method of manufacture of lactic casein.
17. Alkali treatment of separated milk on the reduction in its fat content in the manufacture of rennet casein.
18. Standardisation of the conditions of manufacture of *khoa*.
19. Standardisation of the conditions of manufacture of *channa*.
20. Studies on the manufacture of desiccated *khoa* powder from skimmed milk.
21. Studies on the utilisation of dairy by-products.

DAIRY HUSBANDRY

Herd Development.

The development of high milk yielding animals in the indigenous breeds of Sindhi, Gir and Murrah breeds in accordance with the programme.

Body weight in relation to growth in young calves.

Study of the growth rate of calves of the indigenous breeds viz. Sindhi and Gir.

Dam-Progeny relation in body weights.

Correlation between the weight of the calf and that of the mother.

Study of the variation in fats and S. N. F. of milk.

Tests for interpretation of seasonal variations.

DAIRY HUSBANDRY

SPECIAL

1. Computation of body weight of buffaloes from a measurement of heart girth and length.
2. Raising calves on limited whole milk supplemented by artificial feeds.
3. Comparative efficiency of hand milking *versus* machine milking.
4. Efficiency of utilization of feeds for milk production by cows.
5. Investigation on the possibility of using milking Sindhi cows for work.
6. Comparison of the yield and growth habits of indigenous and cultivated grasses under different manurial and cultural treatment.
7. Effect of feeding iodinated casein to growing calves, heifers and milch cattle.
8. Influence of shark liver oil feeding as supplement on the rate of growth of indigenous breeds of dairy calves.
9. Effect of feeding vitamin A concentrate to cows and buffaloes on the vitamin A potency of the milk.

INDIAN INSTITUTE OF SCIENCE, BANGALORE

DEPARTMENT OF AERONAUTICAL ENGINEERING

1. Experiments on a "Hindustan Trainer 2 Model".
2. Speed setting of the Wind Tunnel.
3. Experiments on Pochkhanawala's Flaps.
4. Propeller Design.
5. Rail Section Investigation.

6. Demor stration Water Tunnel.
7. Design of a Combind Smoke and Wind Tunnel.
8. Chattock's Tilting Gauge.
9. Propeller Fan Investigation.

DEPARTMENT OF BIOCHEMISTRY

FOODS AND NUTRITION

1. Investigations on Vegetable Milks
2. Serum protein fractionation of the blood of rats receiving vegetable milk protein and casein.
3. The supplementary relationship between the proteins of wheat flour and vegetable milk.
4. Biological value of the mixed proteins of vegetable milk and wheat flour by regeneration of liver protein.
5. Predigestion and other processing of edible seed-cakes.
6. Human feeding experiments with soyabean milk.
7. Nutritive value of *Vanaspati*.
8. The presence of nickel in *Vanaspati*.
9. Diet in relation to histological and chemical changes of the liver (*Rats*).
10. Absorption of fat from the human intestine by Chylo-microne count.

EDIBLE OILS AND FATS

Investigations on Indian edible oils, with special reference to the factors affecting their storage property and nurtitive value.

FUNDAMENTAL STUDIES

Enzymes

1. *Thiaminase* : The Thiaminase (an enzyme which destroys vitamin B₁) from fresh water mussel has been purified.
2. *Prothrombin* : The effect of penicillin on blood coagulation has been investigated.
3. *Ascorbic acid oxidase and reductase* : The nature of ascorbic acid oxidase, reductase and protective factors for vitamin C present in green gram (*Phaseolus raniatus*) has been studied in detail.

4. *Phosphorylase* : The effect of vitamin C on the activity of phosphorylase and the influence of protective and oxidising substance on the inhibiting action of the vitamin has been studied.

Vitamins

1. *Vitamin B₁ in groundnut* : The following investigations have been completed.
 - (a) The vitamin B₁ content of groundnut as affected by variety.
 - (b) The presence of free and combined forms of vitamin B₁ in groundnut.
 - (c) The physiological availability of vitamin B₁ in groundnut.
 - (d) Influence of germination on the vitamin B₁ content of groundnut.
 - (e) Influence of manuring on the vitamin B₁ content of groundnut.
 - (f) The effect of various methods of processing on the vitamin B₁ content of groundnut.
2. *Carbohydrates* : A method for the preparation of amylase from starch by thymol precipitation has been developed.

STUDIES IN BACTERIAL AMYLASES

1. Studies of the factors, such as (a) sources of nitrogen, (b) carbon, (c) carbon-nitrogen ratio, (d) inorganic salts, and (e) pH, time, and temperature, which influence the formation of bacterial amylases employing strain of *B. subtilis* (N.C.T.C. 2027 N).
2. Investigations on the purification of the bacterial diastase, [precipitation with (a) ammonium sulphate, (b) alcohol and acetone, (c) ultra-filtration, (d) dialysis, (e) drying in a current of air, and (f) absorbing on alumina gel and other absorbents].
3. Observations on the physico-chemical kinetics with the bacterial diastase.

INVESTIGATIONS ON INFANTILE HEPATIC CIRRHOSIS

1. A comparative study of the thymol turbidity, cephaline-cholesterol and bromosulphalein retention tests of liver function showing that in this disease the thymol turbidity test more nearly paralleled the clinical condition than the other tests.
2. Liver diopsies and histological examination of the biopsy specimens.
3. Analyses of blood serum from patients at different stages of the disease showing that the lipid-phosphorous is lowered whilst the cholesterol level is higher than normal.
4. Phosphorous partition and the content and pattern of aminoacids in blood serum at different stages of the disease.

STUDIES IN ANTIBIOTICS

A systematic assay of the antibacterial activity of many Indian medicinal plants.

STUDIES ON FLUOROSIS

- (a) Mechanism of fluorine removal by calcium salts in vivo.
- (b) Studies on vitamin C and fluorine toxicity.
Removal of fluorides from drinking water.

RESEARCHES ON SEWAGE PURIFICATION AND SEWAGE FARMING

1. Influence of sea water on the activated sludge process.
2. Further studies on the purification of sewage by 'dilution'.
3. Crops suited to sewage and sullage irrigations.
4. Sewage-sickness of soil.

INVESTIGATIONS ON THE POSSIBILITY OF INCREASING CROP
PRODUCTION BY CATALYSING THE RELEASE OF
PLANT NUTRIENTS

1. Researches on the application of ferrous sulphate or manganous sulphate to soil and the use, instead of either of

these chemicals, of a product prepared by reacting ferrous sulphate and burnt lime under controlled conditions.

2. Treatment of Textile Trade Wastes.

List of Scientific Papers Published in 1948-49.

1. Thiaminase system in fresh water mussel (*Lamellidens marginalis*), (*Enzymologia*, 1948, **12**, 238).
2. Purification and separation of the two thiaminase in fresh water mussel (*Lamellidens marginalis*), (*Ibid*, 1949, **13**, 281).
3. Vitamin B₁ content of groundnut (*Arachis hypogea*) as affected by variety, Part I, (*Proceedings of the Indian Academy of Sciences*, 1949, **29**, 59).
4. The presence of free and combined forms of vitamin B₁ in groundnut (*Arachis hypogea*), Part II, (*Ibid.*, 1949, **29**, 65).
5. Physiological availability of vitamin B₁ in groundnut (*Arachis hypogea*), Part III, (*Ibid.*, 1949, **28**, 71).
6. Influence of germination on the vitamin B₁ content of groundnut (*Arachis hypogea*), Part IV, (*Ibid.*, 1949, **29**, 75).
7. The influence of manuring on the vitamin B₁ value of groundnut, Part V, (*Ibid.*, 1949, **29**, 79).
8. Protein content of groundnut (*Arachis hypogea*) as affected by variety, (*Science and Culture*, 1949, **14**, 476).
9. Regeneration of prothrombin activity by carbon dioxide, (*Nature*, 1948, **161**, 354).
10. *In vitro* effect of penicillin on prothrombin activity of bovine plasma, (*Ibid.*).
11. Preparation, purification and composition of pectins from Indian fruits and vegetables, (*Proc. Ind. Acad. of Sci.*, 1949, **29**, 155-67).
12. Some recent developments in new foods and treatment of malnutrition, (*Jour. of Indian Medical Association*, 1948, **17**, 105).
13. Supplementary value of oilseed cakes to South Indian diet, (*Indian Journal of Medical Research*, 1949, **37**, 41).
14. The preparation of amylose by thymol precipitation method. (*Curr. Sci.*, **12**, 366).

15. Studies on vegetable rennet, Part II, (*Ind. Jour. of Dairy Science*, 1948, **1**, 106).
16. Studies on Vegetable Rennet, Part III, (*Ibid.*, 1949, **2**, 19),
17. The effect of certain supplements on the growth of young rats on poor South Indian rice diet, (*Ind. Journ. of Med. Res.*, 1949, **37**, 33).
18. Studies on Indian Edible Oils: Groundnut Oil, (*Ibid.*, Oct. 1948).
19. Studies on Indian Edible Oils—Sesame Oil, (under publication in *I J. M. R.*)
20. Boiled feed waters, (*The Indian and Eastern Engineer*, 1948, **103**, 443).
21. Discolouration and gum spots on raw silk, (*Ibid.*, 1948, **103**, 455).
22. Role of protozoa in the purification of sewage by 'dilution', (*Curr. Sci.*, 1948 **17**, 245).
23. Influence of sea water on protozoal activity and purification of sewage by the Activated Sludge Process, (*Ibid.*, 1948, **17**, 329).
24. Sewage-sickness of soil, (*Science and Culture*, 1948, **14**, 249).

DEPARTMENT OF ELECTRICAL COMMUNICATION ENGINEERING

1. Apparatus for Ionosphere Measurements.
2. Pulse Modulation.
3. Linear Time Base.
4. Decay of Sound in Cubical Rooms.
5. Transit Time Effects.
6. Absorption of Ultra-High Frequency Waves by Sea Water.
7. Dielectric Properties of Solid Insulating Materials.
8. Electrical Constants at Ultra-High Frequencies.
9. Uniselector as Final Selector.
10. A Device for the Control of Road Traffic Lights.
11. Selective Connection of Circuits and Channels.

List of Papers Published 1948-49.

1. Small Uni-selector as Final Selector, (*Electrotechnics*, No. **21**, March, 1949).

2. Absorption of ultra-high frequency waves in salt solutions, (*Ind. Jour. Phys.*, **22**, Part V, May 1948).
3. Effect of moisture content on the dielectric properties of some solid insulating materials at ultra-high frequencies, (*Ibid.*, June 1948, **22** pages 259-64).
4. Absorption of Ultra-high frequency waves in salt solutions, (*Ibid.*, July 1948, **22**, pages 325-32).
5. Absorption of ultra-high frequency waves in salt solutions, (*Ibid.*, December 1948, **22**, 547-52).
6. Electron transit time effects in triodes as negative grid oscillators, (*Electrotechnics*, No. **21**, March 1949).
7. The electrical properties of sea water at ultra-high frequencies, (*Ibid.*, No. **21**, March 1949).

DEPARTMENT OF INTERNAL COMBUSTION ENGINEERING

EXPERIMENTAL WORK

The following items of equipment were installed in the laboratory for test and research purposes:—

- A
1. Pilot workshop equipment in the laboratory.
 2. Chevrolet 100 H.P. engine coupled with Froude Dynamometer of 250 H.P. capacity.
 3. Air-cooled petrol engine coupled to the electronic pressure indicator.
 4. J. A. P. petrol engine.
 5. Broom and Wade Air Compressor.
 6. Installation of the overhead travelling cranes.
 7. 9 H.P. Cooper engine (horizontal type—diesel engine) [on Loan].
 8. Experimental variable permeance generator.
 9. Coventry victor diesel engine 9 H.P. (vertical type).
 10. A compound D.C. Generator (110 volts). This has been installed so that it can be driven by either 7 or 9, above.
 11. 15 H.P. Ruston and Hornsby Diesel Engine.
 12. Torque tackle for twisting tests on shafts, designed and constructed in the Department is nearing completion.
- B. An experimental unit of the variable permeance generator has been constructed and initial tests in the form of preliminary running were conducted.

- C. Metal coated undersized piston-rings have been fitted to the J.A.P. Engine with satisfactory results.
- D. A piston of novel design with a suitable connecting rod for the same, proposed by the Head of the Department, is nearly ready for running tests.
- E. To demonstrate various ways in which propeller and turbine blades may vibrate, a piece of apparatus has been constructed in the Departmental workshop whereby a long flat strip of steel is made to vibrate simultaneously edgewise and flatwise and is viewed by intermittent light from a Strobflash electric lamp. Experimental values have been obtained from this piece of apparatus.

DEPARTMENT OF METALLURGY

1. Studies in carburisation and decarburisation of steels.
2. Etch figures of various pure metals.
3. Electroplating of chromium.
4. Beneficiation of ilmenite and concentration of chromite ores.
5. Investigation on low temperature carbonisation of low grade Indian coals and various properties of the coke derived therefrom.
6. Use of fluoborate baths for studying electro-depositions of Cr, Ni, etc.
7. Investigations on Be and Be-Cu alloys from beryl.

DEPARTMENT OF PHYSICS

List of Papers Published.

1. Sir C. V. Raman and Crystal Physics, (*Proc. Ind. Acad. Sci.*, 1949, **28 A**, 258).
2. The Vibration Spectra of the Alkali Halides, (*Ibid.*, 1949, **28 A**, 296).
3. The Theory of Vibrations and the Raman Spectrum of the Diamond Lattice, (*Ibid.*, 1949, **28 A**, 307).
4. The Dynamic X-Ray Reflections in Carbon Silicide, (*Ibid.*, 1949, **28 A**, 316).
5. The Faraday Effect and Magneto-Optic Anomaly of Some Cubic Crystals, (*Ibid.*, 1949, **28 A**, 360).

6. Theoretical Evaluation of the Acoustic Wave-Velocities in Diamond, (*Ibid.*, 1949, **28 A**, 370).
7. The Influence of Optical Activity on Light-Scattering in Quartz, (*Ibid.*, 1949, **28 A**, 405).
8. The α β Transformation in Quartz, (*Ibid.*, 1949, **23 A**, 417).
9. The Thermo Optic Behaviour of Mica, (*Ibid.*, 1949, **28 A**, 447).
10. The Dynamical Theory of the Vibration Spectra of Crystals, Part V The Fluorspar Structure, (*Ibid.*, 1949, **28 A**, 454).
11. Dynamical Theory of the Vibration Spectra of Crystals, Part VI. The Zinc Sulphide Structure, (*Ibid.*, 1949, **28 A**, 459).
12. Photometry of Raman Spectra of Crystals, (*Ibid.*, 1949, **28 A**, 463).
13. Raman Spectrum of Ammonium Di-Hydrogen Phosphate, (*Ibid.*, 1949, **28 A**, 469).
14. Elastic Constants of Ammonium Chloride and Ammonium Bromide, (*Ibid.*, 1949, **28 A**, 480).
15. Raman Spectra of Sodium and potassium Tartrates, (*Ibid.*, 1949, **28 A**, 485).
16. Raman Spectrum of Ethylene Diamine Tartrate, (*Ibid.*, 1949, **28 A**, 494).
17. Raman Spectrum of Sodium Chloride, (*Ibid.*, 1949, **28 A**, 500).
18. Raman Spectra of Crystals and their Interpretation (*Presidential Address to the Indian Science Congress*, 1949).
19. Influence of Temperature on the Raman Spectra of Crystals, Part III, (*Proc. Ind. Acad. Sci.*, 1949, **28 A**, 40).
20. The Raman Spectrum of Potassium Bromide, (*Nature*, 1949, **163**, 570).
21. Elastic Constants of Alumina, (*Proc. Ind. Acad. Sci.*, 1949, **29 A**, 352).
22. The Elastic Constants of Sodium Chlorate and Sodium Bromate, (*Curr. Sci.*, 1949, **18**.)

DEPARTMENT OF POWER ENGINEERING AND ELECTRICAL TECHNOLOGY

1. Suggested Improvements in the Performance Calculations of Single Phase Induction Motors.

2. High Frequency Oscillator.
3. Shaded Pole Motors.
4. Iron Loss Measurements.

List of Papers Published relating to Research and Development during 1948-49.

1. Power Development with Nuclear Energy, (*Science and Culture*, April and May, 1949).
2. The influence of change of voltage and frequency on the performance of three phase squirrel cage induction motors with special reference to the recent trend in the Mysore State, (*Bulletin of the Mysore Engineers' Association*).
3. Bessel Functions of Complex Arguments as applied to Engineering Problems, (*Electrotechnics*, No. 21).

DEPARTMENT OF PURE AND APPLIED CHEMISTRY

(A) GENERAL CHEMISTRY SECTION

1. Sodium Hydrosulphite.
2. Chrome Mordanting of Wool.
3. Cracking of Hydrocarbons.
4. Butadiene from Ethyl Alcohol.
5. Studies in Adsorption of Gases.
6. Fischer-Tropsch Synthesis.
7. Vapour Phase Oxidation of Benzene.
8. Production of Aldehydes.
9. Reaction in Gases at High Pressures.
10. Sodium Thiosulphate.
11. Reduction of Sulphates.
12. Thiophene from Acetylene.
13. Kaolin.
14. Polarographic Analysis.
15. Metal Complexes of Rice Protein (Oryzenin).
16. Electroplating.
17. Ultrasonic Velocities.
18. Dielectric Constants.

Cytogenetics

1. The problem of Reverse Mutations in yeasts.

2. A study of the nicotinic acid content of the diploid and the tetraploid strains of brewery yeast.
3. A technique has been devised whereby the haploid of a given strain of yeast can be recovered from the diploid, without recourse to micro-manipulators.
4. The effects of chrysene on the two-chromosome brewery yeast strain. BY₁, was investigated as a part of the programme of planned genetical improvement of yeast.
5. The gradual change of the diploid to the tetraploid condition on treatment with chrysene.

List of Papers Published.

1. Rice—Physico-chemical aspects of its curing to secure vitamin conservation and improvement in storage and cooking quality, (*Proc. Ind. Sci. Congr.*, 1948) (Presidential Address, Chemistry Section).
2. Effect of electric field on the degree of depolarisation of colloid systems, (*Proc. Ind. Acad. Sci.*, 1949).
3. Studies on the electro-chemical preparation of sodium hydrosulphite :—
Part I. Estimation of hydrosulphite in presence of sodium bisulphite.
,, II. Reduction of bisulphite with sodium amalgam.
,, III. Electrolytic preparation of sodium hydrosulphite.
C. C. Patel and M. R. A. Rao (*Proc. Nat. Inst. Sci. India*, May 1949, **15**, p. 115).
4. Studies in the catalytic production of butadiene from ethanol, (Part I, *Science and Culture*, 1949, **14**, 436 ; Part II, *ibid.*, 1949, **14**, 480 ; Part III and Part IV, *ibid.*, 1949).
5. Dielectric constants and molecular structure, Part II. Relationship of the new equation to the previous equation, (*J. Ind. Inst. Sci.*, **30 A**, Part IV, pp. 27-37).
6. Dielectric constants of proteins, (*Ind. J. Phys.*, 1948, **22**, 453).
7. Anomalous dispersion of dielectric constant, (*Ind. J. Phys.*, 1948, **22**, 437).
8. Dielectric constant of ionic solids, (*Curr. Sci.*, 1949, **18**, 76).

9. Nature of bond in ionic crystals, (*Ibid.*, 1949, **18**, 130).
10. Ionic character of hydrogen and alkali halides, (*Ibid.*, 1949, **18**, 131).
11. Bond energy and ionic character of hydrogen and alkali halides, (*Ibid.*, 1949).
12. Dielectric constant and molecular structure of chlorocyclohexanes, (*Science and Culture*, 1949, **14**, 482).
13. Dielectric constant and molecular structure, Part III. Dielectric constants of amino acids and other dipolar ions, (*J. Ind. Inst. Sci.*, 1949, **31 A**, Part III 15-42).
14. Dielectric constants of liquids and solids, (*J. Uni. Bom.*, 1949, **17**, 90).
15. Nuclear magnetic resonance and the effect of the methods of observation, (*Curr. Sci.*, June 1949).
16. Studies in the cytology of yeasts, III. The technique of handling yeasts for cytological investigations, (*Proc. Natl. Inst. Sci. India*, 1948, **14** (7), 513-23).
17. Studies in the cytology of yeasts, IV. Endopolyploidy in yeasts, (*Ibid.*, 1948, 325-33).
18. Reverse mutation in yeasts, (*La Cellule*, 1948, **52**, 39-60).
19. Studies in the cytology of yeasts, V. Normal and abnormal mitosis in distillery yeasts, (*Proc. Natl. Inst. Sci. India*, 1948, **14** (9), 389-404).
20. Preliminary observations in the nicotinic acid content of diploid and tetraploid yeasts, (*J. Sci. Ind. Res.*, 1948, **VII B**, No. 8, 129-30).
21. A Gene-determining growth rate in yeasts, (*Ibid.*, 1949, **VIII B**, No. 1, 5-9).
22. Genic differences and rate of growth of yeast, (*Nature*, 1949, 163).

(B) ORGANIC CHEMISTRY SECTION

ESSENTIAL OILS AND TERPENES

1. Essential Oil from the Wood of *Lansium Anamalayanum* Bedd. : Isolation of New Sesquiterpenes.
2. Chigadmarene.
3. Azulenes.
4. Essential Oil from *Atalantia monophylla*.

5. Essential Oil from *Hyptis suaveolens*.
6. Essential Oil from *Hymenocallis tenrifolia*.
7. Work on Sandalwood Oil.
8. Investigation on Cardamom.
9. Utilisation of the Carene Content of the Indian Turpentine Oil.
10. Preparation of Coumarin.
11. Destructive Distillation of Rosin from "*Pinus excelsa*."
12. Acidic fraction.

ETHYL NITRO ACETATE AND CARBONYL COMPOUNDS

1. Study of reaction of carbonyl compounds with ethyl nitro acetate with a view to evolve a general synthetic route to α -nitro- β -hydroxy esters and α -nitro acyclic esters—important intermediates in the synthesis of α -amino- β hydroxy acids and α -amino- β -thiol acids.

STUDIES IN COAL AND COAL TAR PRODUCTS

1. Laboratory experiments to obtain a larger percentage of the acetone-soluble portion.
2. Sulphur Compounds from Coal.

INVESTIGATIONS ON THE INGREDIENTS OF WOOD TAR

1. Bhadravati wood tar (84 lbs.) has been subjected to distillation and fractions coming at different temperatures separately collected, and their solubility in different organic solvents studied.
2. Experiments are in progress to isolate the ingredients in quantitative manner as far as possible, and to isolate compounds hitherto not described to be present in wood tar, by repeated fractionations and crystallisations.
3. Production of Phenol (C.S.I.R. Scheme).

DYES AND DYE-INTERMEDIATES

1. The processes for the preparation of the following dyes (1-11) and dye-intermediates (12-23) were established on a

laboratory scale : (1) Benzidine, (2) β -methyl-anthraquinone, (3) 1 nitro 2-methyl-anthraquinone, (4) 1-amino-2-methyl-anthraquinone, (5) 2, 2'-dimethyl-1, 1' dianthroquinolyl. *p*-nitrosophenol, (7) dinitrophenol, (8) anthraquinone- β sulphonic acid, (9) naphthionic acid, (10) sulphanilic acid, (11) 2-amino-anthraquinone, (12) chrysamine G, (13) congo red, (14) fast red A, (15) alizarine yellow R, (By), (16) indanthrone A, (17) sulphur black, (18) hydrone blue, (19) indanthrene golden orange G, (20) methyl violet, (21) malachite green, (22) galleine B, (23) orange II. The process for the manufacture of orange II on pilot plant scale was established. The plant fitted up is capable of producing 30 lbs. of the dye in one operation.

STUDIES WITH METHONE

1. *Hydro-acridones*.—The N-methone substituted anthranilic acids reported last year were cyclised to the corresponding hydro-acridones. Their Clemmensen reductions are being studied.
2. Clemmensen reduction of aldimethones.
3. *Studies with Sulphuryl Chloride*. The conditions for the preparation of this chemical are being established with a view to employing it in a systematic investigation of the sulphonation and chlorination processes.

SYNTHETIC DRUGS

Synthetic Antimalarials

1. Preparation of New Antimalarials.
2. Tri-substituted guanidines.
3. Sulpha-biguanides.
4. Poly-guanides.
5. Phenyl pyridines.
6. para-Amino salicylic acid.
7. Studies in Thiazolidines.
8. Local Anaesthetics.

List of Papers Published during 1948-49.

1. Metachloridine-substituted aryl biguanides as possible anti-malarial compounds, (*Nature*, 1948, 162, 146).
2. Action of diazomethane on triacetyl gallolyl chloride, (*Curr. Sci.*, 1948, 17, 264).
3. 2-Thiol-4: 5-diphenyl-imidazole derivatives, (*Ibid.*, 1948, 17, 184).
4. Studies in Sesquiterpenes, Part III: Syntheses of Homocadalenes, (*J. Indian Chem. Soc.*, 1948, 15, 315).
5. Studies in Sesquiterpenes, Part IV. Hydriodic acid from simultaneous ring closures and reductions—Syntheses of alkyl naphthalenes, (*Ibid.*, 1948, 25, 323).
6. Studies in Antimalarials, Part VI. Sulphabiguanide derivatives, (*J. Indian Inst. Sci.*, 1948, 30 A, 1).
7. Studies in Antimalarials, Part VII. Metachloridine substituted arylbiguanides, *Ibid.*, 1948, 30 A, 9).
8. Aryl-cyanoguanidines from aryl-azocyno-guanidines, (*Curr. Sci.*, 1948, 17, 186).
9. Studies in Antimalarials, Part VIII. Arylcyno-guanidines from aryl-azo-cyanoguanidines, (*J. Indian Inst. Sci.*, 1948, 30 A, 16).
10. Studies in Sesquiterpenes, Part V. The essential oil from the oleoresin of *Hardwickia pinnata*, (*J. Indian Chem. Soc.*, 1948, 25, 495).
11. Studies in Antimalarials: Some N¹-(8-chloro-5-quinolyl)-N⁵ substituted biguanides, (*Curr. Sci.*, 1948, 17, 185).
12. Studies in Antimalarials: Some R- and R'-disubstituted guanidines, (*Curr. Sci.*, 1948, 17, 238).
13. Anæmia in Chicks infected with *P. Gallenaceum*, (*Ibid.*, 1948, 17, 237).
14. Structure of a by-product obtained during the Clemmensen reduction of β -(*p*-cymovl-2-)-propionic acid, (*J. Indian Chem. Soc.*, 1949, 26, 31).
15. Piperazine derivatives, (*Science and Culture*, 1948, 14, 210).
16. Studies in Antimalarials: N¹-Aryl-N⁵-alkyl-biguanides, (*Curr. Sci.*, 1948, 17, 272).
17. Some new Aminothiazoles, (*Ibid.*, 1948, 17, 298).

18. Schiff's Bases of 4, 4-Diaminodiphenyl sulphide, (*Ibid.*, 1948, 17, 330).
19. Some N¹-aryl N⁵ heterocyclic-biguanides, (*Science and Culture*, 1949, 14, 368).
20. Studies in Antimalarials, Part IX. N¹-aryl N⁵-alkyl-biguanides, (*J. Indian Inst. Sci.*, 1948, 31 A, 1).
21. Studies in Antimalarials, Part X. N¹-aryl N⁵-heterocyclic-biguanides, (*Ibid.*, 1948, 31 A, 9).
22. A new synthesis of *p*-amino-salicylic acid, (*Curr. Sci.*, 1949, 18, 75).
23. Preliminary antimalarials screening tests of some biguanide derivatives, (*Ibid.*, 1949, 18, 50).
24. Preparation of Paludine (Proguanil), (*Ibid.*, 1949, 18, 77).

(C) CHEMICAL ENGINEERING SECTION

1. Methanol Synthesis.
2. Fisher Tropsch Synthesis.
3. Manufacture of Hydrogen.
4. Ammonia Synthesis.
5. Manufacture of Beryllium.

List of Papers Published.

1. Performance of Sieve Plate Fractionating Columns, Part I. Effect of distillation rate and concentration, (*J. Indian Chem. Soc. Ind and News Ed.* XI, 1 and 2, 1948).
2. Performance of Sieve Plate Fractionating Columns, Part II. Effect of area and size of perforation, (*Ibid.*, XI, 1 and 2, 1948, p. 12).
3. Performance of Sieve Plate Fractionating Columns, Part III. Effect of plate spacing and submergence, (*Ibid.*, XI, 1 and 2, 1948, p. 19).

(D) SECTION OF ECONOMICS AND SOCIAL SCIENCES

1. Assessment of Personality Values.
2. Measurement of the Security Council.
3. Effect of Prohibition on the Personality of the Industrial Worker.

INK BLOTS

List of Papers Published.

1. Honesty Index, (*Proc. Ind. Sci. Cong.*, 1950).
2. Injury to Mind, (*Ibid.*, 1950).

INDIAN SCHOOL OF MINES & APPLIED
GEOLOGY, DHANBAD

DEPARTMENT OF GEOLOGY

1. The Eurite dyke of the Giridih Coalfield.
2. Rapakivi structure in the Epidiorites and Injection gneisses near Dhanbad.
3. Petrology of the Basis Intrusive Rocks of Gomoh (E I.R.).
4. Cordierite-bearing bornfelsic and vitrophyric rocks of Ramnagar, Raniganj Coalfield.
5. On Reaction Rim in the Olivine-bearing meta-norite of Dhanbad.

DEPARTMENT OF METAL MINING

1. A Rapid Method for Analysis of Colloidal Graphite, (*Science and Culture*, Vol. 13, 510, 1948.)
2. Graphite Heating Baths, (*Ibid*, 1948, Vol. 14, 79.)
3. Beneficiation of Graphite from Mysore State. (*J. Scientific and Ind. Research*, 1948, VIIB, No. 10, 167-68.)
4. A New Method for the Analysis of Adulterated Graphite, (*Ibid*, 1949, VIIIB, No. 9, 168-9.)
5. Studies in Colloidal Graphite, Part I, (*J. Indian Chem. Soc. Ind. & News Ed* 1948, XI, No. 3.)
6. Contact Angle of Natural Graphite, (*J. Scientific & Ind. Research*, 1949, VIIIB, No. 12, 232-4.)
7. A Rapid Method for Identifying Different Types of Graphite, (*Ibid*, 1948, VIIB, No. 12, 201-2.)
8. The Burning Rate of Indian Graphite, (*Ibid*, 1948, VIIB, No. 11, 187-8.)
9. A Rapid Method for Analysis of Natural Graphite, (*Ibid*, 1950, V9B, No. 1, 22-3.)
10. Colloidal Graphite—A New Lubricant, (*Science and Culture*, 1949, 15, 216-9.)

11. Graphite Industry in Ceylon, (*Indian Minerals*, 1949, 3, No. 2)
12. A New Type of Grinding Aid in Disintegration of Solids, (*Proc. 37th Ind. Science Cong. Part III. Abstracts* 1950.)
13. Beneficiation of Low Grade Manganese Ores, (*Ibid*)
14. Beneficiation of Lead-Zinc Ores from Zawar, (*Ibid.*)
15. Flotation of Pyrites from Mysore, (*Ibid.*)
16. Determination of Chlorine Linked to Organic Compounds in Coal, (*Ibid.*)
17. Simultaneous Determination of Total Chlorine, Nitrogen and Phosphorous in Coal, (*Ibid.*)
18. A Simple Flotation Cell, (*J. Scientific & Ind. Research*, 1950 V9B, No. 3, 76-7.)
19. Suitability of Ceylon Graphite for Crucible Manufacture, (*J. Scientific & Ind. Research*, 1950, V9B, No. 4, 105-6.)

DEPARTMENT OF CHEMISTRY

1. Glass, with special reference to a study of the feasibility of producing a durable glass with raw materials available in India. This also includes how durabilities of "like" glasses are affected by alterations in compositions and how radiation from different sources influence the durabilities.
2. *Recovery of Sulphur* from Sulphidic Ores. In this connection attempts are being made to suggest some modifications in respect of the existing methods for isolating some of the metals.
3. Analytical methods for Coal.
4. *Refractory* :—This involves utilisation of shales for refractory purposes. (This work is going on in collaboration with the Department of Applied Geology).
5. *High tension Electrical insulators*. This embraces a study of the feasibility of utilisation of Indian variety of talcum for the production of bodies like (1) Clinoenstite and (2) Cordierite.

DEPARTMENT OF PHYSICS

1. Structure of Diphenyl (*Proc. Nat. Inst. Sci. Ind.* Vol. 15, p. 11 1949).

**TATA INSTITUTE OF FUNDAMENTAL RESEARCH
BOMBAY 1**

- I: Cosmic Radiation (Experimental).*
1. Wilson Chamber Work.
 2. High altitude measurements of cosmic radiation with the radio sonde technique.
 3. High altitude measurements of cosmic radiation with photographic plates.
- II. Nuclear Physics (Experimental).*
1. Instrumentation technique.
 2. Ionisation Chamber.
- III. Mathematics.*
1. Statistics, Tensor Analysis, Theory of Differential Equations.
 2. Algebra (theory of groups, rings and fields).
 3. Topology (theory of measure and integration).
 4. Analysis (Functions of a Real or Complex variable, Fourier integrals and series, Tauberian Theorems).
- IV. Theoretical Physics.*
1. Quantum Mechanics.
 2. The Theory of Elementary Particles.

VISVA-BHARATI SANTINIKETAN

S A N S K R I T

1. Similes of Kalidasa.

BUDDHIST PHILOSOPHY

1. Cittavisuddhi Pr. of Aryadeva.
2. Karatalaratna of Bhavya.
3. Abhidharmasamuccaya.
4. Abhidharmamrita.
5. Bodhicittotpada-sutra.
6. Vajrasuci.

IRANIAN STUDIES

1. Indo-Iranian Studies I.

2. Indo-Iranian Studies II. (Interpretation of the Gathas).

ISLAMIC STUDIES

1. Sharmad Shahid.
2. Studies in Shah Wali Allah.

ORIYA LITERATURE

1. Bhagavadgita of Balaram Das.
2. Panchasakha Movements.
3. Mahima Dharma.
4. Collection of Oriya Folk-Songs.

BENGALI LITERATURE

1. Gorkhavijaya.
 2. Descriptive Catalogue of Bengali MSS.
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